The Builder.

VOL. XXVIII.—No. 1412.

A Recent Peep at the Great Pyramid.

OF the seven antique wonders of the world one only is still extant. The Pharos of Alexandria no longer sheds its light over the waters of the Mediterranean; Apollo Colossus has long since gone to the melting-pot; the crys-elephantine Olympian Zeus of Phidias has been turned into amulets and squared into dice; jackals labour the ground where once stood the terraced gardens of Babylon—the paradise of Nebuchadnezzar. The Temple of the Ephesian Artemis is sunk for ever in the marshes of the Cayster; the dethroned monarch Mausolus has taken refuge in England, and from his pedestal in the British Museum placidly looks down upon the remains of his celebrated sepulchre,—a monument of departed greatness. But the Pyramid of the Cheops still stands erect on the western bank of the Nile. The storms of forty or more centuries have but chafed its surface; and though the palaces of Cairo have been partly built out of the stones of its *revêtement*, yet it remains apparently uninjured, and is likely to remain to the end of time. Climate, no doubt, has had much to do with its wonderful state of preservation. Had it been built in a country with cold and damp atmosphere, the moisture would have penetrated between the joints, and the frosts and thaws uplifted and riven its enormous courses of stone, as in northern climes they rive the granite mountains; but in Egypt, where literally there is no rain, no damp, no frost, Time has not these slaves to help him in his work of destruction.

Such an ancient monument as this, which existed before Abraham went down into Egypt, has been necessarily described by many writers. We have in our possession a book, called "Les Plantz des Villes," published in 1573, which contains a medley of good things. Poictiers, "the city of Peru," and the Pyramids are all therein described and illustrated, and we borrow from it a list of the writers of antiquity who have touched upon the pyramid, viz;—Herodotus, Duris of Samos, Aristagoras, Dionysius, Artemidorus, Alexander Polyhistor, Butorides, Antisthenes, Demetrius, Demoteles, and Apiori; and we are also informed that Thalis, of Miletus, obtained its height by measuring its shadow at the proper moment. Heredotus, perhaps, gives the most complete account. He tells us that the Pyramid of Cheops was built in twenty years by 100,000 men; that they commenced by constructing a road from the Nile, of polished slabs of stone, ornamented with figures, for the transport of the stones. He mentions a canal formed by Cheops, in the midst of which was an island and a chamber, and he describes also the manner in which the outer covering (which was smooth) was laid. He says that upon the steps (those formed by the courses) were raised machines of timber,—evidently including inclined planes,—by means of which the huge stones of the casing, 30 ft. in size (they were triangular), were raised stage by stage to the summit, which was completed first, and the work continued downwards to the basement, this being evidently the only manner in which the work could be accomplished. In addition to these ancient writers, we have had in more modern times dissertations by Le Brun, Grobert, Jomard, Meister, Hirt, De Sacy, Langles, Belzoni, Lepsius, Howard Vyse, and, though last not least, Piazzi Smith, who has compassed and spanned every stone, so to speak, of the Great Pyramid, and written an exhaustive book upon the subject, to which we beg to refer every one who wishes to study it in a serious manner.

Our object is simply to describe the impression made upon ourselves during a day's visit to it, in the belief that however frequently it has been spoken of, and however often it has been visited, a vast structure somewhat about the size of Lincoln's-Inn-Fields at its base, and somewhat higher than the cross of St. Paul's, which existed when the world was in its cradle, and will in all probability accompany it to its tomb, can never be considered commonplace, hackneyed, and uninteresting.

We left our hotel in the Esbekiah, Cairo, in a carriage before daybreak, accompanied by two Americans, who had joined us at Jaffa,—a fat doctor and small minister. Half an hour's drive brought us to the banks of the swollen Nile at Old Cairo. Here the donkeys and their drivers, who had been convoked by our dragoman, joined us, and we embarked in a caique at a spot which some have called Charon's Ferry, possibly because, in the time of old Egypt, bodies were here embarked on their way to the necropolis. Our Charon did not, however, bid us "trim the boat and keep quiet," but he himself was trimmed and kept quiet by our dragoman, for, as he demanded more than his obolus, our man felled him like an ox. He then arose, shook himself, and became a wiser if not a better man. In this we obtained a striking confirmation of the sad truth which we had learnt in our previous dealings with Orientals, which was, that if you wish to gain your point with either pasha or peasant, you must prostrate him, morally first, and then demand the favour of his compliance with your request that he will do his duty or perform his contract. On board the caique, in close companionship with us, were our favourites, Ginger Pop and Yankee Doodle; the former was a white donkey, of sturdy build, very like the one that figures in a picture by Gerome which will occur to the recollection of some of our readers. He derived his name from the fact that as he had made the pilgrimage to Mecca he had received the distinctive badge of a hadji, by having his mane and tail dyed with saffron, till they were the colour of ginger. He fell to our lot, and we mounted him on reaching the opposite bank with a certain degree of pleasure, for we knew by experience that he was a trustworthy steed. Yankee Doodle fell to the lot of the fat doctor, who to revenge himself upon those who had named his beast, beguiled the way by persuading his driver that his donkey would never be in want of a rider if he changed its name to Lord Dundreary; and by the time he reached the Pyramids, by dint of constant repetition, the boy had got the name pat.

Our ride was a pleasant one, not in a straight line to the Pyramids, which we saw always before us, but, as the waters were out, by various turnings and windings on dykes and causeways, which, in the time of the inundation, served as the roads of communication between the various villages that crowned the summits of mounds rising out of the water on both sides of us. Each mound had its grove of date-palms; its group of white flat-topped houses; its crowd of fellahs, of fellah women in blue smocks and black nose-bags, called veils; and its naked children—like animated bronze figures, with the delicately-moulded forms peculiar to the dark-skinned races—sporting in and out of the shallow water, evidences of the exuberant life with which the Delta and that part of Egypt swarm.

After passing many of these picturesque oases, by about noon we began to ascend to the rocky platform on which the Pyramids are situated. Before we had reached it, a swarm of swarthy Arabs swooped down upon us, yelling and gesticulating, and seized our bridles. After recovering from our first surprise, we were reassured by finding that, though their manners were rude, their language was refined. To be accosted in our mother-tongue, spoken with a perfect accent, by a troop of dirty savages, was something novel for the lower class of Levantines, who, when they do speak a little English, generally interlard their discourse with expressions which they have picked up from sailors,—not exactly pleasing to ears polite. These men, on the contrary, had gathered their vocabulary from the hundreds of educated men who had visited the Pyramids on their way to or from India. Hence the amusing contrast. Still, however satisfactory their accent, it was not agreeable to be unseated by half a dozen pairs of unwashed hands. So there were loud calls for the Scheik, who, after preliminary conversation, by dint of loud persuasion, combined with force, prevailed upon his followers to leave us unmolested to choose our own guides.

We have mentioned hitherto but one pyramid, that of Cheops, as it is the largest and best-preserved of all; but pyramids of all sizes are to be found at intervals on the borders of the Nile, between the Delta and Jayoum, and always on the western bank only. Lepsius visited sixty-seven within a distance of thirty-six miles. At Ghizeh there are three large ones, and the remains of six diminutive ones at their feet. It has been affirmed, to account for these different sizes, that each monarch began to build his tomb as soon as he ascended the throne, and that he added a course or two to the exterior every year of his reign, and that in this manner the size of the pyramid is an evidence of the length of the reign of the monarch who built it; but this could hardly have been the case, for Cheops reigned sixty-three years, while Herodotus, who must have gained his information from the traditions of the priests, asserts that his pyramid was built in twenty years.

Besides those of Ghizeh, there are groups of pyramids at Sakkara, Abouroueł, Abousir, Dashour, Matanyeh, and Meidoun. All are on the same plan, with an internal chamber for sepulture, the entrance to which has been concealed by the external masonry, and all are in a more ruinous state than those which we saw at Ghizeh.

During our approach to the Pyramids from the Nile they grew so gradually upon our sight that we could hardly realise their vast dimensions until we got near enough to see some individuals belonging to a party which had preceded us descending at one of the angles, in proportion to the mass like mites to a Cheshire cheese. Leaving our donkeys in the shade, we hurried to one of the angles, where the ascent is easier than elsewhere, and commenced our pilgrimage to the summit. Two Arab guides are allotted to a man, and three to a lady; they keep hold of your hands, and by dint of hauling and

pulling (for the courses forming the steps are, in some places, 3 ft. or 4 ft. high), contrive to land you, puffing, panting, at the summit, if you do not give in by the way. Our fat doctor gave in at a third of the height, the lady who was with us at three-fourths, and the short minister and ourselves reached the summit—a platform of about 30 ft. square—in safety. Here we sat down to recruit and enjoy the glorious prospect, of Cairo and the Nile on one side, and on the other the reddish waves of sand, stretching as far as we could see towards the desert of Jupiter Ammon. Near us were the two other pyramids, those of Cephrenes and Mycerinus, beneath us was the rocky necropolis, full of indentations and irregular cuttings, marking the site of excavated tombs, and a little beyond, on a lower level, appeared the head of the Great Sphinx.

While we rested, the conventional Arab performed the conventional feat of running down one pyramid and up another, for the gratification of a slight *baksheesh*. The ascent of the second pyramid must be difficult, as the outer smooth casing in part remains; but he accomplished the feat in less than ten minutes. We then prepared to go down. This was an arduous and somewhat dangerous undertaking, as the treads are generally very narrow, and are half-covered with rubbish. You are completely at the mercy of your guides, who hold you by each hand, and take a delight in compelling you to acts of agility, which, when you are middle-aged, slightly inclined to *embonpoint*, and have not the sure footing of a goat, are in a slight degree distressing, particularly when you know that one false footstep would be sufficient to roll you to the bottom and convert you into a modern mummy. Our fat friend was so fully impressed with the idea of this risk, that he had actually promised his guides the unheard-of *largesse* of five shillings if they would deposit him safely on the sand below; consequently, on gaining the ground, we found him a general favourite, attended by a crowd of Arabs, who evidently thought him "soft" as well as fat. He had suddenly become the hero of our party, and we who were not so liberally inclined were constantly reminded of his indiscretion by such speeches as this: "It is customary to give poor Arab more than the ordinary *baksheesh* given to Scheik. Fat man very good man; he give poor Arab five shillings." In fact, he had created a complete revolution, and had spoilt the market for future visitors, as we subsequently learnt from one of them at the *table d'hôte* of our hotel. There are upwards of 200 courses, varying from 4 ft. 4 in. to 20 in. in depth in the Great Pyramid. Herodotus states that the outer casing was ornamented with carved figures, probably hieroglyphics.

After a hearty luncheon, we prepared for the second act—a visit to the interior. We found the entrance a little above the level of the sand, and in the middle of one side. Here we each took a lighted candle or torch, and entered, stooping and crawling as we found best, a passage, 4 ft. square, which descended gradually at an angle of 25 degrees. We could not stop to examine the construction of this gallery, as we were preceded and followed by Arabs, who urged us on; and as the suffocating closeness of the atmosphere, joined to our uncomfortable position, made us anxious to get into some more commodious portion of the building. After descending for a few minutes, we commenced to ascend at the same angle, and at last reached a deep well in our path, which served as an approach to the lowest chamber, which is seldom visited. Beyond the well we entered a higher gallery, where we had more breathing room. It was about 24 ft. high to the top, and was covered by a horizontal arch, *i.e.*, one composed of stones corbelled out on both sides till they meet, the ends being cut away so as to present internally two sloping sides. This gallery ascended at so sharp an angle, that it would have been difficult to walk up if holes had not been cut here and there in the polished floor for one's footsteps. It was about the same width as the first passage. At the top we entered by a vestibule into the King's Chamber, containing the sarcophagus of Cheops, the founder of that stupendous structure. This chamber is about 34 ft. by 18 ft. in dimensions, and is roofed over by flat slabs placed side by side. The sarcophagus is of porphyry, and is covered with hieroglyphics; as the pyramid has been built round it, fortunately, it cannot be removed entire, and so possibly it may be allowed to remain, to rejoice the eyes of generations of travellers. As soon as we reached the chamber, the Arabs began to howl and dance, for the gratification of their fat benefactor, what appeared, from their dusky figures, grinning faces, wild shouts, and whirling torches, a regular *ronde infernale*. The heat and closeness were suffocating, as may be imagined would be the case in an upper chamber in the centre of the pyramid, to which there was no opening except by a considerable descent, so that the air cannot have been renewed except by chemical change since the time of the Pharaohs. We were, therefore, not sorry to emerge into the open air, for we knew that there was nothing about the construction of the pyramid that we could not learn from books, as it has been so frequently measured and illustrated.

Our last visit was that made to the Great Sphinx, whose head and shoulders only are now visible above the ever-encroaching sand. She is no beauty, as her face was remorselessly ruined by a fanatical scheik in the fourteenth century. Her nose has disappeared, but the firm projecting under-jaw remains; and this, together with her retreating forehead, combines to offer a type of that deformity which was so attractive to certain Pre-Raffaellites, who copied vulgarly the early eccentricities of their now-reformed leader. If the sphinx were uncovered, she would be a marvel hardly second in interest to the Great Pyramid, as she measures 150 ft. from the extremity of her extended paws to the root of her tail; and, moreover, she holds between her fore-paws a temple, in which divine honours were paid her. The entire figure is cut out of the rock on which the pyramids stand,—all deficiencies being made good with masonry. Amongst the conflicting theories about Egyptian chronology, it is difficult to fix the exact date of the erection of the Pyramid of Cheops, but we know that the Sphinx was completed in the time of Thothmes IV., who reigned in the year 1561 B.C., so that in all probability it was constructed many centuries after the Pyramid.

The point chiefly to be noticed in the Great Pyramid, besides the wonderful harmony observable in its dimensions,—for a correct understanding of which the before-mentioned book of Piazzi Smith should be carefully perused,—is the occurrence of the first example of the horizontal arch, which was borrowed from the Egyptians by the Greeks, and employed by them in the Treasury of Mycænæ; the gates of Assor; at a later period in the Fountain of Hippocrates, in the Island of Cos; and in the Mausoleum. It is also to be remarked that its external form was adopted by other nations as the distinguishing mark of a sepulchre. We find that not only was the magnificent tomb of Mausolus surmounted by a pyramid, but that also smaller sepulchres, such as that of Theron, at Agrigentum; the Lion tomb of Cnidus, the monuments in the Valley of Jehoshaphat, and many of the Roman tombs in Africa, had also pyramidal roofs. And may we not trace the steeple of St. George's, Bloomsbury, and all magnificent *perrons*, even that of the Prince's Monument in Hyde Park, to the same remote source, however indirectly they may have been derived from it?

THE ARCHITECTURAL EXHIBITION.

The honorary secretaries of the Architectural Exhibition Society have sent out a circular to the leading members of the profession, and to the societies representing the profession, of architecture, in town and country, calling upon them for more efficient aid and contribution to the Exhibition, both in the form of drawings to be exhibited, and in the more solid and perhaps less attainable shape of money subscriptions. Unless this desired assistance be more liberally given than heretofore, and a greater general interest shown in the success of the Exhibition by those most concerned in its success, namely, the architects of this country, it appears probable, according to the circular referred to, that it cannot be continued after the present year. Whatever difference of opinion may have existed as to the real importance of the Architectural Exhibition hitherto as an exponent of the state of architectural art in the country, and a means of extending the knowledge and appreciation of architecture among the general public, there will probably be few of our readers who will not concur with us in thinking that the discontinuance of this Exhibition for want of the support asked for would be a sign of a very undesirable move in a direction in which none of us individually wish to travel,—backwards.

It may be said that as the Royal Academy have announced their decided intention of keeping one room in their new building for architectural drawings, provided a sufficient number of good drawings be sent to fill it; or, at all events, to give in that room the preference in position to architectural drawings over others, that a special exhibition for them becomes superfluous; and that it is far better for the profession, those of them who have anything worth exhibiting, to concentrate their forces in one place, more particularly when that place is one to which, at certain seasons, numbers of people congregate, and where indeed it is not quite the right thing *not* to go. And, no doubt, to hang architectural drawings in one of the Royal Academy's rooms in the full fever of the season does insure a greater number of people seeing them and passing them than perhaps any other means; and it may be as well that the Academy, who number architects among their body, should openly give their recognition of architecture as an important art, and that there should be a chance that some of the large majority of visitors to the Academy, who know and care absolutely nothing about architecture, should have their interest awakened by some cunningly-prepared drawing, and that those who come to scoff should remain to praise. But to this possible advantage there are important drawbacks. In the first place, architectural designs exhibited in the form of drawings do not stand on the same ground as the rest of the works in an exhibition like that of the Royal Academy. The paintings, water-colour drawings, sculptures, there ranged are works complete in themselves, and which have attained their purpose and end; but an architectural drawing is merely a representation, in a very imperfect way, of what the architect (or his draughtsman or colourist) thinks will be the effect of the work if executed, unless we except the cases in which the drawing represents what the architect knows will not and cannot be the effect of the actual building. Here, then, is the architecture at a double disadvantage. If the exhibitor makes his drawing really an architectural drawing, such as an architect might find it worth his while to study with the view of arriving at a key to the structural and æsthetic design of the building represented, it is evident that this drawing must be looked at from quite a different point of view from the drawings and paintings which form the bulk of the collection; that its merits, if any, will be of a perfectly different kind; and that it will have to be considered as a means, not as an end. But it is idle to expect that the public who throng the picture-saloons of the Academy in May and June will draw this distinction when they enter the Architectural Gallery. Not one person in a hundred, probably, goes to that suite of rooms with a view of taking a thoughtful and critical pleasure in works of art; they go to see pictures, some of which interest, some amuse, and some puzzle, them; and the architectural gallery, filled (according to our present supposition) with what look to them more like diagrams than paintings, will merely be passed over as a blank break in their chain of sight-seeing, suggesting nothing to them. If, on the other hand, we keep to the practice which caused so much comment among the French architectural critics at the time of the Paris Exposition, of making our architectural drawings only a series of picturesque views, we have then to put them in competition, as *pictures*, against the other attractions of the Exhibition-rooms, with what kind of result may be easily foreseen. An architect can rarely afford to employ a really first-rate artist to make his design into a picture for him (even if the first-rate artist would undertake the job); besides which, the necessity for showing clearly the details of the building, and making it predominant, and everything else in the drawing only accessory, of course militates against artistic effect. So that we have no choice at the Academy, save either to be passed over by the mass of spectators as unintelligible, or to be made light of as inferior to the other works of art in the same building. Add to this the comparatively small scale and minute detail of most architectural drawings, which must of course give them an insignificant effect alongside of large and powerful oil-paintings or water-colour drawings, and it will be seen at once how impossible it is that the ordinary run of visitors to the Academy will give any intelligent attention, or any attention worth having, to the architectural drawings occupying a corner gallery of the building to which they have come for pleasure or study of a totally different kind.

Such considerations are, we imagine, sufficient to show the eligibility, even the necessity, for a separate exhibition of architectural drawings, where these initiatory representations of architectural design can be viewed and studied upon their own proper basis, apart from the distracting influence of works of art of a wholly different nature. And there is probably scarcely any architect of talent or eminence, in town or country, who, if the question were directly put to him, "Do you consider an architectural exhibition necessary or desirable?" would not immediately answer in the affirmative. One provincial society, that of Liverpool, has already, as our readers will have seen in our last number, expressed its opinion decisively on this head, in a resolution passed at a general meeting of the members; and assuming, as we think we may do, the existence of this general approval of the scheme, it is somewhat surprising that the Exhibition Society should be suffered to be now, after a career of some years, in a position to feel compelled to solicit the support which it might have been thought the architectural profession at large would before now have thought it their interest to give to them. That this is so is, perhaps, partly traceable to a certain laziness and "save-trouble" feeling among individuals of the profession. A would be glad enough to hear that there was a good exhibition, but he cannot be troubled to pack up and send off drawings for it, still less to make a drawing on purpose to exhibit: he thinks B, who got that town-hall competition, ought to send up something; but he has not time himself to think about it. We have heard exactly this said more than once; and if the object were to fill the walls with designs for very large and grand works, this would be a valid objection; for few architects have the luck to get a really grand commission to carry out.

But we want to know how small things are getting built, and how they should be built, as well as large ones; and a design for an ordinary-sized dwelling-house, which shows originality and refinement in plan and conception, is more valuable than the most astoundingly impossible perspective view of a town-hall where these qualities are absent. It is the bane of the system of architectural competitions that architects get, through them, into a habit of only wishing to astonish spectators by dint of mere bigness and splashiness of drawing. An exhibition where the chief critics would be professional men, who can see into the real worth of a design, and are not to be taken in by draughtsmen's dodges, ought to be a great corrective against this evil. It is to be feared, however, that the reason why many who might contribute to the architectural exhibition do not, is, that it does not "pay;" that the drawings are not sufficiently known and seen by the public; and that, in fact, the exhibitors cannot trace many commissions as having arisen from the display of their works in the room in Conduit-street. This, if a somewhat narrow, is still not an unnatural feeling; and it is certainly to be regretted that the architectural exhibition has attracted so little public notice generally, on the part of those not directly connected with the profession. The very great ignorance of even educated people as to what constitutes architecture as an art, and their consequent want of interest in and comprehension of the drawings which illustrate it, is, of course, mainly the cause of this indifference; and it will take a long time, and a much better system of art education in our schools, to do away with this stumbling-block.

However this may be, we do not think that in the meantime the architectural profession of England ought to allow the exhibition to drop, because the general public do not show so much interest as they might (and, we may add, *ought*) to show in it. Taking a serious view of the profession of architecture, involving the solution of many difficult problems, artistic and practical, which concern the beauty and well-being of our towns and villages, so great is the advantage and instruction to be gained by architects from a knowledge and study of the works of their contemporaries, at home and abroad, and from knowing in general what is going down and what is coming up in their profession, that it is worth while to make a stand for an exhibition which will give us these advantages; and this the Architectural Exhibition may certainly be if it is generally supported and contributed to as it should be. In the present state of public non-interest in architecture, it is, indeed, next to impossible that such an exhibition should be self-supporting, and, perhaps, this is the most difficult part of the matter; "the penny-fee will be a hard chapter, we doubt." But if even one-fourth of the architects in this country would make up their minds to subscribe something towards the necessary expense of keeping up the Exhibition, the amount requisite from each for this purpose would, probably, be something quite trifling, and of scarcely any account at all in comparison with the importance of the object. One word may be added as to what ought to be the nature of the drawings to be exhibited. It is not entirely without cause that we have been twitted by some French critics with caring for nothing in our architectural drawings but the making of pretty pictures. It may be said that this is the only form in which non-professional people care to look at an architectural drawing at all. The sooner they are taught differently, then, the better. But the exhibition will not, at all events for the present, be for non-professional visitors, but mainly for architects. Let it then be made such an exhibition as architects can really visit with advantage, and derive some instruction from with regard to each other's mode of working. Small perspective sketches are all very well, if honestly done, to show the architect's idea of what his building should look like in execution. But the magnificent views and vistas which confound the minds of competitive committees are out of place in a professional exhibition. We know they are all humbug, and it may be necessary to indulge in a little of this sometimes to please clients; but there is no reason why we should flourish it in each other's faces. What we want are drawings and plans which will enable us to trace out the whole working of a design; and especially large-sized and careful drawings of portions of a building, wherever anything special, either constructive or artistic, has been attempted, would often be very valuable for study, especially by young students. Let us be assured of an exhibition, in short, that will be of real value to professional visitors, and we trust there will be found among the architectural profession of this country sufficient *esprit du corps* and love of their art to induce them to give it a cordial and substantial support.

CLAUSES IN THE IRISH LAND BILL OF INTEREST TO THE BUILDER.

It does not fall within the scope of our columns to enter into any general discussion of that extensive and complex measure, the main features of which were laid before the House of Commons on the 15th inst. Dealing, as it purposes to do, with the main question of the tenure of land in Ireland, its probable advantages or disadvantages involve many considerations that are foreign to our pages. But there is one point on which our readers may naturally expect that we shall not be altogether silent, and that is the probable and purposed effect of the Act, should it become law, on the operations of the builder.

The proposed provisions of the measure, in this respect, are capable of ready and distinct definition. It is a common practice in Ireland—and Mr. Gladstone expressed the surprise that he felt on becoming aware of the fact—although not in England, to value the buildings on a farm apart from the farm itself. That practice increases the facility with which any improvements made by a tenant in the form of permanent buildings, can be estimated. It is the intent of the measure to increase the security of the occupier of the land, and to render difficult and costly eviction on the part of the landlord, except in case of non-payment of rent. Certain rules of compensation for such evictions are laid down; but, in any case, it is proposed to recognise the right of an outgoing tenant to payment for permanent buildings erected by him, if they are applicable to agricultural purposes, and if they are such as to improve the letting value of the property. It is necessary that such additions to the holding should be suitable for the purposes of agriculture, as, otherwise, they would not come within the scope of the tenancy. Thus a case was cited in which the tenant of a farm abutting on the sea-shore built a bathing-house, and claimed to be paid for it as an improvement. Such an outlay would not come within the provisions of the present Bill. It is quite clear that it would be unjust to saddle the landlord with a payment for any building which was altogether apart from the terms of the contract for occupancy, and which, although serviceable to one occupier, might prove useless to another.

The onus of proof as to the authorship of such structural improvements—to which the Bill proposes to assimilate the case of the reclamation of land—is thrown upon the landlord. That is to say, if the tenant claim to have erected a certain building, it is for the landlord, if he dispute the claim, to show that it has not been erected by the tenant. On the one hand, of course, the building will be to the fore to prove its own existence. On the other hand, it is presumed that the landlord will have, or ought to have, proper plans and surveys of his estate, which he can produce with all necessary books and records, so as to show that the improvements which the tenant claims to have effected were in existence at a date prior to his claim.

It is further provided that respect must be had to any advantages already derived by the tenant from improvements which he has effected on his holding. It is not easy to see how this provision applies to the case of permanent buildings erected by the tenant at his own cost. If his rent has been raised in consequence of such improvements effected by him, he will have paid twice for them, once in the interest of the money laid out, and once in the increased rent. The opposite case, of an abatement being made in rent, in consideration of permanent buildings being erected by the tenant, is not likely frequently to occur. In that case, no doubt, he would, altogether or in part, have recouped his outlay. It can hardly be urged that the general principle of such compensation is unjust.

A further provision which touches the subject of domestic building is that which allows of the sub-division and sub-letting of land by a tenant for the purposes of cottages and gardens. It is proposed to allow of such sub-division for the use of servants employed upon the farm, or for agricultural purposes. Into the general question of the policy of the case we cannot enter. It is, undoubtedly, proposed to limit, or rather to confiscate, certain rights which the owners of land have hitherto considered to attach to proprietorship. It is not, however, certain that such a limitation would be a positive grievance to the proprietors. In a merely financial point of view it is possible that it may be to their advantage.

But it is clear that the tendency of this portion of the measure would be to encourage domestic building in Ireland. A tenant would often be disposed to make substantial improvements in his holding, if once he had the assurance that the money he thus laid out, so far from giving the landlord a firmer hold on his rental, would not, in any case, be absolutely lost to the family of the improver. The tendency would be good in two ways. It would lead to the erection of convenient buildings, which otherwise would be deferred or avoided, and it would lead to the more workmanlike and permanent finish of the buildings so erected. In a country for the most part rich in excellent building materials, the hope of compensation would favour the transformation of the straw-thatched, clay-built hut, into the neat stone-built cottage or outhouse. The transformation which the last twenty-five years have effected in many English country villages is marvellous. Neat cottages, often with architectural pretensions of no mean order, are to be found replacing the old huts, partly timber-built, partly plaster, partly rubbish of any description, with windows the size of pigeon-holes, thatched roofs, and no means of ventilation, and which look so picturesque in pencil sketches. Those who are familiar with Ireland will know how much room exists for improvement in this respect. Our own experience is not such as to make us sanguine as to the rapid effect of legislation, even supposing it to be guided by as much wisdom as is competent to parliamentary legislators, in changing the long-formed habits of a race. Still, it is one thing to strive to enlist human nature on the side of progress, and another thing to ignore its well-known motives. In proposing to give the builder compensation for the work of his hands we trace at least a possible rudiment of increasing civilisation.

The rental of Ireland, it is well here to place on record, was estimated in 1779 at 6,000,000*l.*; in 1869 it is returned at 12,000,000*l.* The rental of England in 1771 was estimated at 16,000,000*l.*; in 1869 it is returned at 48,000,000*l.* The rental of Scotland in 1770 was stated at 1,200,000*l.*; in 1869 it was 7,200,000*l.* Thus, during the same period of time, speaking in round numbers, rents have doubled in Ireland, trebled in England, and sextupled in Scotland, the term selected being that

of ninety years. It will be a matter of interest to compare the increase of population, and the augmentation in the size of the capitals and great cities of manufacturing and commercial industry, with this increase in rent. The rate of increase of London, for instance, is known: it doubles in a little less than forty years. On the other hand, the constant decrease in the value of money, which has been so much accelerated since the discovery of the Californian and Australian gold-fields, has to be set off against the nominal increase in rental. The subject is one on which the materials for exact comparison have yet, to some extent, to be collected. It is closely connected with the question of the improvement of the habitable nature of the country, the sanitary, civilising, and æsthetic progress of domestic architecture.

We have confined ourselves to an examination of that portion of the Bill now before Parliament which distinctly interests the architect and the builder. But a lesson is involved in the statement incidentally made by the First Lord of the Treasury in introducing this important measure, of which we ought not to lose sight. We have, not unfrequently, had occasion to warn our readers against the exaggerated and pedantic application of rules which, while sound up to a certain point, prove altogether fallacious when they are relied on as main and normal laws of social conduct. Human nature is more complex, as well as more noble, than either the pence or the multiplication table; and no error can be more lamentable than that which leads to the attempt to weigh all human nature in the partial and restricted balance of finance. The correlation of supply and demand is an important truth, and one which can not be neglected without producing certain and appreciable evils. We are even now smarting from the neglect of this law in the premature construction of railways, which were supplied, for the benefit of the individuals interested in their construction, in the absence of any such real demand on the part of the public as might justify the outlay.

But to attempt to apply this rule as adequate to meet all the exigencies of a complex state of civilisation is a miserable and mischievous pedantry. It is this fact which is so distinctly illustrated by the Irish returns quoted by Mr. Gladstone. It is undeniable that one main cause of the Irish trouble is the fact that cultivation of the land is almost the sole national industry, if, indeed, it be allowable to use the word. With the exception of parts of Ulster, almost the whole support of the Irish people is derived from agriculture or pasture. The mining, metallurgic, textile, commercial, and other occupations which are carried on by so large a proportion of the population of Great Britain, are, in Ireland, chiefly conspicuous by their absence. The oat-field or the potato-ground, — such is almost the sole resource of the great majority of five millions and a half of Irishmen. It results from this fact that the competition for land is keen. Independently of the strong passion for the native soil, which forms a predominant feature of the Irish character, land has a value in the eyes of the ordinary Irishman far greater than is the case with the Englishman on the same social level. In fact, the occupancy of land is, for the most part, the sole means by which the former exists.

Demand for land, therefore, is at a maximum in Ireland, as compared with England. Supply, on the other hand, is limited and fixed. On the principles of political economy, therefore, the price of land,—that is to say, rent,—ought to increase in Ireland in a ratio far more rapid than is the case in Great Britain. And with this increasing rental every inducement to the economical, industrious, remunerative use and culture of land must, theoretically, concur. In some parts of the world we know such to be the case. We may cite China as an instance. There the ratio of population to land is very large, and there the utmost ingenuity and industry are exercised to obtain the largest returns from the coveted soil.

The facts quoted by Mr. Gladstone, however, are at total variance with a theory which must be true if the rules of political economy were those which regulated human action. The case of Ireland is absolutely the reverse of that which ought to prevail, did the correlation of supply and demand settle all social questions by a self-operating influence. During the period which has witnessed the tripling of the rental of England, and the six-fold multiplication of that of Scotland, that of Ireland has only doubled. The rich stream of productive industry which has been turned into so many channels among ourselves has indirectly increased the value of landed property. The mere fact that land was in demand has altogether failed either to enhance its price or to improve its culture, to an extent at all comparable with the result of what may be called the contagion of industry.

The actual ratio of land under corn crops per head of population does not differ very sensibly in the three kingdoms. In Scotland the proportion is 2·31 mouths per acre, in England 2·61 mouths per acre, and in Ireland 2·56 mouths per acre. But the proportion of sustenance derived from the potato is far larger in the latter country, where a million of acres are devoted to the culture of this root. The actual facts are highly instructive.

England contains 32,590,397 statute acres, of which 22,261,833 were under cultivation in the year 1866, about a third being under corn crops. The population in that year was 11,461,217.

Scotland contains 19,639,377 statute acres, of which 4,158,360 were under cultivation in the year 1866, about a third being under corn crops. The population in that year was 3,153,413.

Ireland contains 20,322,641 statute acres, of which 15,549,796 were under cultivation in the year 1866, less than one-seventh of which were under corn crops, two-thirds being permanent pasture. The population in that year was 5,571,971.

In England, therefore, there existed 2·8 acres of land, of which 2·00 acres were cultivated for every soul of the population. In Scotland there existed more than 6 acres for every individual, although only about 1⅛ acre per head was under cultivation. In Ireland there were 3·6 acres, of which nearly 2·8 were cultivated per head. It must be stated, however, that in the case of Ireland, the hill pastures are included in the returns, which is not the case in the English statement. Half of the land cultivated in England is devoted either to grass crops or to permanent pasture. In Ireland 11¼ millions of acres out of 15½ millions are pasture and grass crops. Thus, while the English population cultivates about an acre per head for corn, green crops, and fallow, the Irish population cultivates only about two-thirds of an acre per head for these purposes, while about one-fourth of the area of the island lies permanently waste.

The above figures are ample to show that those who endeavour to account for human action on the simple principles which regulate purchase and sale, or supply and demand, take a view of a large subject so inadequate as to be properly designated as puerile. While the Irishman, who depends solely on land, has a third less land, for every mouth, to cultivate than has the Englishman, who leans on so many other industries for support, the return which he wins from his culture, measured by the secular increase in the rental, is as two to three when compared to the English rental return. The comparison with Scotland is even more striking. The climate of that kingdom is more severe than that of Ireland. With the exception of the valley of the Clyde, the aid to be derived from her agricultural industry is not to be compared with that afforded by the great mineral wealth of England. But the high moral character of the Scotsman, his patient forethought and untiring industry, are made evident by proof stronger than any words that we can employ. While cultivating less than a fourth part of the area of his mountainous country, a breadth of land which is, as in the case of England, about equally divided between pasture, whether permanent or annual, and crops chiefly useful for human sustenance, he tills for human support about the same area per head as does the Irishman. Yet the results of his industrial toil, in the course of nine-tenths of a century, as measured by the increased value of the rental, is just threefold that which has been attained in the more favourable climate from the more fertile soil of the Emerald Isle.

It is undeniable that moral causes must have no small influence in producing such various results of national activity. To neglect or ignore the genius of a people, or of a race, is as unphilosophical as to neglect the conditions of soil or of climate. And the error is not one of theory alone. Were it so, we should find little disposition to discuss it. It enters into the very life of a people. It influences the course of legislation, no less than that of administration. Mr. Gladstone prefaced his motion by the discouraging doubt whether the main features of legislation for Ireland since 1793 had not tended rather to injure than to improve the condition of the Irish people. He admitted the existence, under identical laws, of a state of custom and habit so different in the two kingdoms as to amount to disparity of law. The gist and upshot of the whole matter is, that it is not legislation to which we must look for the sole, or even the main, sources of improvement. Laws, in their operation, if not in their origin, are the reflection of national character. Let law be amended, if reason demand it; but let us not expect, from any alteration in the statute-book, that national progress with reference to which law bears little more than a negative relation. We may remove injustice; we may remove obstacles to agriculture, to industry, to commerce; but such removal is only a part, and a small part, of that which we have to do. The formation of truthful, honest, industrious, habits; the inculcation of mutual respect and forbearance between class and class, as well as between individual and individual; the encouragement of a large and catholic tolerance for all honest opinion; the spread of that knowledge, social and technical in the first instance, although rising to higher branches of culture by its own innate force and truth;—these are the matters for which it behoves us to labour, and these alone are the means to make the desert blossom as the rose.

On comparing the amount of rental stated by Mr. Gladstone with the details of agricultural statistics from which we have ourselves made the foregoing extracts, it appears that the average rent of cultivated land in England is about 2l. 3s. per acre; in Scotland, 1l. 14s. per acre; and in Ireland, 15s. per acre. This comparison fully bears out the tendency of our foregoing remarks.

PROFESSOR SCOTT ON ARCHITECTURE AT THE ROYAL ACADEMY.

LECTURE I.

WHEN I delivered my last lectures in this Acedemy, it was my intention to give a practical sketch of the history and development of architecture in this country from the earliest rise of civilisation among the races of which our nation is composed, down, perhaps, to the period of the revival of Classic architecture. As, however, such continuous history has been disturbed by the omission of my lectures last season, and as few now present heard, and fewer, probably, now remember those lectures, it is not my intention to continue my former course, but, adopting as my stand-point the stage at which I had then arrived, to digress into an inquiry into some of the practical and artistic principles of the class of architecture of whose development I was then treating.

The chronological point which I had reached was the close of the eleventh century,—a point well fitted to be chosen as one for leaving the beaten track for the purpose of inquiring into principles. It was the very stage at which the great round-arched style, which had just developed itself into a strong and sturdy luxuriance, was in the condition best suited to receive the refinements of art.

It was, too, the very eve of that wonderful politico-religious movement which was to bring the nations of the West into contact with the East;—thus preparing the way for a vast influx of new ideas and of fresh artistic elements; and, so far as our own country was concerned, it was just the moment when the simple and unambitious architecture of the Anglo-Saxon race had given place to the more colossal edifices and the more systematic style of the Norman invaders; and when the newly-imported architecture, having taken firm root in our soil, was ready to become naturalised as our own, and to be pressed forward in all zeal and earnestness by the united races which—now neither Saxon nor Norman—were becoming, to all intents and purposes, *English*.

Nor let it be supposed that the architecture, thus made ready as the nucleus of subsequent developments, was in itself essentially rude, or mean, or barbaric. I admit that it was stern and severe, and lacking the refinements of advanced art; and that its sculpture, though a reflection from that of Byzantium, as that had been from ancient Greece,—was nevertheless grim, uncouth, and unrefined; yet in grandeur of conception and in vastness of scale its productions vied with those of almost any period or country; and I shall be able to show you that it contained principles the most profound and accurate, and capable of being carried forward to any degree of refinement.

A single half-century had in fact filled the

length and breadth of our land with structures of prodigious scale and impressive grandeur; founded on the most reasonable principles, and containing, in a rough and unrefined form, the most prolific and the most artistic elements. So many of these vast edifices have given place to others of more advanced style, or have been recklessly destroyed, that we can now with difficulty realise the architectural status of a country where they were rising or were just completed in every town and (on a reduced scale) in almost every village;—a period when vast fortresses, such as the Tower of London and the stupendous keeps of Rochester, of Norwich, and of Headingham were specimens of the vernacular architecture to be seen all over the land; when the now shattered ruins of Newark and the grim tower of Newcastle were as freshly erected as their names imply; when the awful names of Durham and Gloucester were but specimens of the "new manner of building" then recently introduced, and which pervaded the whole land; and when no city, or hardly a village, could be approached without the lofty scaffoldings heaving first into view which surrounded campaniles which could boast such as those at St. Alban's and Tewkesbury as their types.

We will, however, quit the track of mere history, to inquire into the intrinsic principles of the architecture thus far attained, and in course of development; and I must beg to be forgiven if, in doing so, I am compelled to repeat a good deal of what I had brought under your notice in former lectures; for, not then intending to go systematically into this inquiry, I had forestalled my subject by adverting to these principles from time to time as the course of my historical sketch chanced to suggest.

I shall, then, firstly consider the architecture in question,—this "*novum genus ædificandi*,"—from a point of view bearing upon its great structural characteristic as a purely *arcuated* style, and one whose strivings all took the direction of rendering that structural fact the main source, as well as the main receptacle, of its artistic character and decoration.

Now what, I would ask, are the conditions necessary to an *arcuated*, as distinguished from a *trabeated*, style?

I would thus define them:—Generally, I would say that such a style should be capable of doing all, whether structural or artistic, by means of the *arch*, which other forms of architecture had done through the use of the horizontal *beam* or lintel.

And, to go more into particulars, I would add:—

1. That, as a rule, openings in walls and between pillars, whether taking the form of doorways, windows, gateways, or intercolumniations, should be bridged over by arches instead of by horizontal lintels or entablatures, though not descending into such purism as to reject the latter when circumstances clearly point to its adoption.

2. That areas inclosed by walls, or by ranges of piers or columns, and of any reasonable width, should be capable of being covered over,—and, in buildings of the highest grade, should as a rule be actually covered over,—by *vaulting*. This rule, however, not being pressed so far as to exclude level ceilings or timber roofs,—the one the most natural and economical covering for rooms, and the other for churches, halls, &c.,—where circumstances forbid the use of vaulting.

3. That the decorative system of the architecture should harmonise with, and result from, these prevailing structural conditions; the construction and the architectural treatment being, not only in harmony, but in the most intimate alliance the one with the other.

Now we all know that Grecian architecture almost ignored the arch, carrying the horizontal or trabeated system of covering openings to the highest artistic perfection; doing for that system just everything which the above-stated conditions would demand for an arched style. *Repose* was the great sentiment which their architecture expressed; *vertical pressure*, the one physical condition it had to provide against; whereas arched architecture (as they say in India) "never sleeps." It is always exerting pressure in some other direction than the mere vertical line, and the physical conditions it has to meet are the resistance of these, as well as the support of mere weight.

We know, too, that Roman architecture admitted nearly all the constructive conditions we have demanded, and carried them on to a very considerable degree of practical perfection. We believe, moreover, that had not circumstances checked its progress, it would have carried out these conditions to a much greater extent. As it happened, however, it did not go so far as to make these structural conditions a leading artistic element, and the groundwork of a distinctive decorative system; but, being broken up through political convulsion before such an end was attained, it bequeathed the task to the descendants of its despoilers, and long centuries of darkness had to pass by before the work could be accomplished.

In Roman works, the arched construction was in many cases studiously overlaid and concealed by the decorative features of trabeated architecture; and, where an arch was architecturally treated, it was for the most part by bending round it the mouldings of an architrave or *beam*: and, where a vault was rendered ornamental, it was often by repeating on its coved surface the coffered panels which had originated in a horizontal ceiling; while, in purely arcuated works, such as the stupendous aqueducts, architectural decoration was usually ignored, and structural grandeur alone trusted to for beauty. Still, however, enough was done to convince us that these great builders were on the high road to a noble solution of the problem, and were only, by external accidents, stopped short of its attainment.

I am not about to indulge in abstract imaginings as to what an arcuated style of architecture might be if originated without the aid of previous associations or traditions; but I would ask you to follow out, with some reference to the previous Classic styles, and aided by our knowledge of subsequent developments, the *rationale* of such a style as that whose leading conditions I have stated.

We must begin with the simplest elements of the style.

Firstly, then, let us take a mere opening in a wall, whether intended for a window or for any other use. As in the trabeated system, apart from architecture, such an opening would be covered by a single block of stone, so in an arched system would it be bridged over by an arch; and, just in the same manner, if a continuous series of openings were required, equivalent to a colonnade, the same simple idea would be repeated,—in the one system horizontal stones lying upon upright ones (as at Stone House) or upon piers, and in the other the openings being covered by a series of arches; the *colonnade* being the ultimate result in the one case, the *arcade* in the other.

To architecturalise the arched opening, or the continuous arcade, the simplest expedients seem to be the insertion between the pier and the arch of an impost moulding to mark the springing line; and, in the arch, either to individualise the arch-stones by chamfering their edges, as the Romans often did, or to relieve their plain surface by moulding, the latter being best suited where the stones made use of are of only moderate size. The mouldings of the arch may, however, be continued down the jambs without an impost, and in either case a projecting rim or hood-mould may be introduced over the main arch to emphasize the line which separates the arch from the superincumbent wall.

These simple changes bring our plain arched opening into something like an architectural feature; and, if we apply them to a continuous arcade, the architecturalising process becomes yet more apparent, and it may readily be carried a step farther by adding pilaster capitals to the piers. Another and yet more important step, inasmuch as it is really the basis of a very marked feature in our arch styles, is the substitution of columns for the piers of an arcade; which columns, having square abaci, are really as well fitted to support the arch as the square pier itself, and at once give a highly decorative character to our arcade; and the more so if the jambs are converted into pilasters.

The abaci, however, of such bearing-shafts ought to be very different from the delicate finish of the Corinthian capital; for the arch is not the same inert load which the columns in a trabeated style are destined to carry. It exerts diagonal as well as mere vertical pressure, and so demands a firmer base. This led the architects of the early arched styles, while adopting the Corinthian capital, and perhaps reusing those of older buildings, to add to it a strong flat stone as an impost upon which they could safely give the springers of their arches a basis larger in diameter than the sustaining column. This form,—that is to say, the Corinthian capital with an added impost,—became traditional, and we find the imitations of it down to the end of the twelfth century.

We have hitherto supposed our arches to be of moderate depth from extrados, or outer line, to intrados, or inner line, and our walls, perhaps, of moderate thickness. Let us, however, assume it to be necessary to increase the depth of the arch, and that the materials at hand are not of large size. In some of the Byzantine remains in central Syria, where the stone is of great size, we find that they have architecturalised by mouldings and enrichments only just so much of the arch-stones as was needful for beauty, and left the rest to go as mere wall-face; and where such large stones are not made use of, it is common enough to build the arch in two rims, and only to deal architecturally with the lower one, or perhaps to leave both plain.

Now, the first may be unobjectionable where the wall is of moderate thickness and the load great, and the second is well suited to large and massive engineering works; but for ordinary architecture, it is apt to give too bulky and cumbrous an effect. This naturally suggests the idea—while allowing the upper range of arch-stones to occupy the full thickness of the wall—of reducing the lower range to a smaller width, thus breaking the arch section into resalient angles, and thereby both lightening its effect and rendering the piers or jambs which support it lighter and less obstructive to the view.

Simple as this step may appear, it is one whose importance can scarcely be over-stated; for it is the starting-point of the entire system of Romanesque and Gothic arch-moulding; it is the origin of the clustered columns, and the deeply-recessed and richly-decorated doorways which mark those styles; and to it we owe in great measure even the traceried windows which are such leading characteristics of Gothic architecture. For, as regards arches, we had before but one angle to mould, whereas we may now have as many as the thickness of our walls will permit, thus generating at once the great Mediæval system of receding orders, whether of arches or their jambs; and you will presently see that this gives us also our clustered columns, which are, in fact, the mere decoration of the receding orders of the piers.

Let us, however, take another step; and, instead of substituting a column for the group of arch-orders, let us substitute either a smaller column for each of the four orders, thus supporting the arches by a group of four columns; or else let these be united into one complex pillar formed of portions of four columns; or, thirdly, let us place a colonnette under each order, grouping them either in the solid or as detached shafts, round a central square pier. In any of these methods we at once obtain the clustered column.

To the jambs we may apply the same process, either substituting a colonnette for the inner order, and pilasters for the outer ones, or *vice versâ*, or substituting colonnettes or pilasters for all. I do not know how early this system of using colonnettes to do merely decorative duty was introduced. We have a specimen of it in the remains of the church built by Benedict Biscop, at Monk Wearmouth, in the seventh century, where, as I have stated in a previous lecture two baluster shafts are placed in either jamb of a doorway to support the impost. To go to the far East, we find the system in use in the Mosque of Touloun, at Cairo, built, I believe, in the ninth century. In one of the doorways of the cathedral at Mayence, built about the end of the tenth century, columns and pilasters, with Corinthian capitals, and crowned by a thick impost moulding, are alternately employed to carry the four receding orders of the arch. The whole has semi-Classic details. In the western portals of St. Mark's, at Venice (close upon the same period), we find a profusion of detached columns similarly used. They are of marble and other rich materials, and were probably brought to Venice from ancient buildings in the East.

It may be that the possession of such antique relics, and the long-established practice of reusing them, may have suggested the use of small columns for such purposes; indeed, it is curious that in the case of the Mosque of Touloun, just alluded to, as a very early instance of the use of colonnettes, there is a tradition that the architect, who was a Christian, was imprisoned for refusing to use the columns torn from desecrated churches, which had been a condition prescribed to him, and only consented to proceed with the work on the withdrawal of this order. Whether

or not this custom originated the feature under consideration, I think that it is one which belongs essentially to a *derivative* style, and would hardly have come into existence in a style of architecture not aided by traditions of the past. The Romans themselves, as is proved by their mural paintings, seem to have indulged in the use of their columns (possibly of metal), for buildings not demanding massive dignity; and it is just possible that in their domestic architecture, some suggestions of this use of such pillars might have existed; and certainly among Mediæval works, in none are they more charmingly introduced than in the cloisters of St. Paul and St. John, at Rome, whose details are much more Classic than Gothic.*

EXHIBITION OF THE ROYAL SCOTTISH ACADEMY.

We cannot say that any of the works exhibited by the local artists this year can be considered as displaying super-excellent qualities, yet it is gratifying to observe that there is a levelling-up process going on, and that there are fewer works that can be classed as beneath mediocrity. The average of excellence, therefore, is greater, and more especially is this the case in the department of landscape painting; and considering the fact that we are so constituted that there is a certain connexion between our external surroundings and our inward thoughts, we may reasonably look to Scotland for a school of landscape painters displaying characteristics of its own; and as it may now be safely asserted that the Northern artists have achieved a marked degree of success in this department, it will meet with our first attention.

The landscapes of Sir George Harvey have a distinct individuality. He does not aim at striking effects, nor does he elaborate detail, nor allow any one part of the subject to predominate in a manner to destroy the general effect sought for. He depicts the cool, breezy upland moor or the peaceful pastoral valley, when Nature is in one of her calm, self-sustained moods; and, when seen from the proper point of view, the scene is full of air, and recedes far away into the distance in which each object is distinctly defined. No. 456, "A Mountain Tarn"—the only landscape he exhibits,—is a characteristic example.

A many-sided man is Mr. Sam Bough. He shows us nature in every phase. He is equally at home on sea or land; amongst the mountains or on the plain. No. 386, "On the Solway," is one of the best paintings he has ever produced. The scene must be familiar to those of our readers who have, in their journeys to Scotland, gone by way of Carlisle. At low tide the river is seen as a broad, shallow sheet of water, bordered by flat expanses of sand, with tufts of green on their margin. Mr. Bough has introduced a herd of cattle being driven through the water, whilst another drove is seen coming up in the distance; sea-fowl are disporting and feeding in the immediate foreground, and the eye is lost in the far distance of the ocean. In No. 446, "Skye," we have the landscape of that island as we know it, and as no other painter, so far as we are aware, has presented it to us. It is a land of rain, with a "brief, bright summer," according to Alexander Smith; but its brightness, in our experience, is very evanescent indeed: the thin film of mist enveloping the hill-sides, as shown in the picture before us, would not prevent a Skyeman from calling it very fine weather.

Mr. James Cassie's pictures are always pleasing, and his work is thorough, but not overdone. He luxuriates in calm sunshine, "when nature seems asleep;" and he is not afraid to look "the god of day" in the face, as may be seen in his "Early Morning on the Tay" (339).

Mr. John Smart has the right stuff in him, if we are not mistaken; for the last few years he has been going on improving in the grasp and mastery of the subjects to which he sets himself. No. 473, "Head of Glen Cloy, Arran," has many of the same qualities as the works of the President; and No. 869, "Beallach-na-Spreidh — Pass of the Cattle," would have attracted greater attention were it not for its resemblance to the fine cattle-piece of Mr. Peter Graham (which hangs in another room)—the same that was so much admired in the Royal Academy last year.

Mr. Colin Hunter is another young artist of promise. No. 718, "Fern Gatherers returning Home," is a striking picture, the effectiveness of which is produced in a very simple manner by the contrast of three horizontal bars of colour; the principal figure, however—that of a girl—is feeble and doll-like. Not so striking, but better as a whole, is No. 832, "Mending the Nets," in which a broad daylight effect is happily rendered.

Mr. Joseph Farquharson has chosen a hackneyed subject for his principal picture (401), "Evening,"—a pine wood, with a road running through it, and a rich sunset filling up the vista: it is, however, well rendered, and we look to him for something much better in the future.

Mr. Walter Pation gives us sunset effects year by year. They are pretty and popular, especially with ladies: it is their very prettiness, however, that we object to; but we must take them as we find them. Purple is his favourite tint, and this prevails in No. 731, King's Cross Point, Arran." In No. 500, "Falls of Glen Ashdale, Arran," a fine subject is spoilt by a sickly straw-colour being given to every tree and blade of grass.

We should have noticed sooner the exhibits of Mr. M'Whirter, No. 592, "Harvest by the Sea," No. 723, "Moor of Bannock," and No. 735, which all display that careful, effective manipulation and mastery of materials which have gained for him a high position.

There are several young men doing their endeavour to produce good landscapes, and we would like to have given them a word of encouragement, but our space is limited, and we must now pass on to the figure-subjects, taking no notice of those which have already been exhibited elsewhere.

Sir Noel Paton (limner to Queen Mab as well as to Queen Victoria) gives us one of those subjects which he has made a speciality, and in which he has no rival. No. 574, "Caliban," shows us the monster listening "to sounds and sweet airs" produced by aërial figures which float around him. The contrast between the heavy, animal matter of Caliban, and the airy, intangible, semi-transparency of Ariel and the accompanying phantoms, is finely rendered, and the scenery of the enchanted island is a beautifully suggestive piece of landscape, seeming as if it would dissolve into air like a dream. No. 728, "The Village Connoisseurs," of Mr. MacTaggart, is a large and happy group of children following a vendor of plaster casts. The juveniles are beautifully painted and natural, if we except their eyes, which are rather too bright, and startle one at first sight by their gem-like effect,—an effect which is heightened by the subordination of the accessories. It is, withal, a fine picture, and would be finer still were a few weeks' more labour bestowed upon it. No. 394, by G. Paul Chalmers, is a life-size study of an old woman reading the Bible, and is remarkable both for vigour of handling and delicacy of colour. The old lady is a type of a class once common in Scotland, but now fast disappearing. She is evidently a firm believer in the Calvinistic interpretation of the Book. No. 505, "A Love Song," being a Spanish lady with her guitar, is brilliant, rich, and warm in effect. Were Mr. Chalmers to concentrate his energies upon a large and important painting, and prove as successful in composition as he has done in manipulation, colour, and character, he would place himself in the foremost ranks of this Academy. No. 408, "Prince Charlie's Parliament," is not one of Mr. Macdonald's happiest efforts. "The young cavalier" is a great favourite of his, but we have never before seen him so unjust to his hero; neither is the colour good: the treakly opaqueness of the walls of the hut in which the council of war is held, is especially harsh. No. 474, "Maternal Care," and 629, "Play," by Mr. Hugh Cameron, display his usual delicate sense of colour and unaffected manner. The expression of the mother in the former and the merry gambols of the children and kitten in the latter show that he can be both pathetic and merry in the proper place and circumstances.

No. 901, "After Marston Moor," by W. E. Lockhart, shows us a cavalier bidding a lingering farewell to his wife and child ere he goes into exile. The male figure is well placed on the canvas, and is truthful in expression; and so, too, is the sturdy babe whom he caresses, but the grief of the lady is only surface deep. There is considerable quaintness in the scene from Longfellow's "Courtship of Miles Standish" (667). No. 511, by Mr. James Drummond, represents Queen Mary led captive to Edinburgh, after the Battle of Carberry Hill, when she was subjected to the reviling of the populace, on account of her supposed complicity with the assassination of Darnley. The queen is dignified, tearless, and dauntless; one would fain hope she were guiltless. The picturesque timber façade of the High-street forms an admirable setting for the figures, but the subordinate groups want completeness. No. 644, "Travellers' Tales," by W. Douglas, is painted with that minuteness of detail and carefulness of finish usual in the works of this artist; in this picture the figures of the two men have met with more attention than he generally gives to them; but still the wine-flagons, &c., are what most attract the notice of the spectator. In No. 538, "The Laird's Pew," Mr. Peter Graham introduces us to a precise old squire of the time of the Georges, who is bent upon being decorous and setting a good example to the parish, but there is little true devotion in him; his daughter, again, is desirous of displaying her charms and fine attire to the best advantage.

No. 304, "Roba de Roma," is the fruit of Mr. Keeley Halswell's recent visit to the Eternal City. Two remarkably fat, jolly-looking priests are intent in the examination of certain ecclesiastical curiosities, which a Jewish vendor is pressing upon their notice, whilst a younger priest is more attracted by the pretty face of a peasant girl, who is taking her goods to market. It is a work displaying great vigour of execution and discrimination of character. Mr. George Hay is fond of Mediæval subjects, which he renders in a quaint and suitable fashion. No. 361, "The Scrivener's Booth" is a characteristic example; and in No. 628, "La Bonne Bouche," we have a subject of later times set before us with equal facility. No. 443, "A Quiet Pipe," and No. 710, "Alone in his Study," by R. P. Bell, are cabinet pictures, crisp in execution and subdued and harmonious in colour.

The architectural drawings will meet with due attention in a future notice.

ART-WORKMANSHIP: SOCIETY OF ARTS.

We must add to the list of creditable specimens under Division II. (application of ordinary industry, to prescribed art processes) mentioned in our last,* the champagne glasses (118—120), made by Joseph Leicester, in which difficulties, including the introduction of filigrani, are well overcome, and a very successful result is produced. Some glasses with filigrani, sent by T. C. E. Barnes (45—49), are also meritorious, but are unnecessarily thick and heavy. Some of the book-covers by Charles Ffänder are tastefully executed. The only set of fire-irons exhibited (55) are woefully ugly and spikefully unsuitable. For the prize offered for an envelope-case, enriched with carving in low relief and marqueterie, two competitors appear. The case sent by Edward T. Grove is a very charming work.

Coming now to the third Division, articles sent in addition to those of prescribed designs and processes, we find an excellent mask, *repoussé* in copper, of one of the Laocoon group (61), by G. Deere; "Solitude," embossed in copper, by J. C. Day (70); and a circular ornament very cleverly pierced in metal (74), by A. Millward. The purpose to which the latter can be applied is not very obvious, but the regularity of the forms and the precision of the cutting are praiseworthy. Under the head of wood-carving there are figures of Moses and Elias formed with inlays of various woods: they are somewhat hard and *gauche*,—Elias especially, but should not be passed by. Such work might be found useful in mural decoration. 84, oak bracket by R. A. Brangan, and 85, panel in birch wood, by W. Matthews deserve mention. The works modelled in plaster call for little mention. 101, North America; Indian, by A. Dufour, is spirited and vigorous and a wreath of flowers, by T. Godfrey (100), has some elegance. Among the carvings in marble, 109, a bracket, by S. Moutrie, deserves mention. A stone bracket, by T. E. Jago, shows good intentions. A human head is introduced, and some inlays. The red colour of that in the top ornament gives a certain degree of vulgarity, and lessens the value of the rest of the work. 116, study in Tisbury stone, "May," J. R. Heath, is a remarkable piece of cutting, though not defensible in principle: few would guess that the work was in stone. The tea service (125), designed and executed by Isaac Wild, should certainly obtain for him some recognition; the ornament, though not well selected, is well

* To be continued.

* See p. 141, *ante*.

executed, and the gilding shows more than common skill. The "Burning Heart," a porcelain slab, by Miss L. L. Hawkins (131), is a quaint conceit, or "Emblem," better intended than executed. And with mention of a porcelain tray, painted with "David, the Psalmist;" and a very good cameo portrait of Dr. Billing, executed from the life, artist not named, we may bring our notice to a close.

Beyond the premiums offered by the Society of Arts, the North London Exhibition Prize, consisting of the interest of 167*l.* 7s. 3d. Consols, is to be awarded for the best specimen of skilful workmanship in the exhibition of works sent in for prizes. We have reason to believe that this will go to Messrs. W. & H. Robson, for their wrought-iron work for a balcony, a decision in which we should fully accord.

PARIS STUDIOS AND THE "GRAND PRIX DE ROME."

WE have mentioned in a former paper the architectural subjects taught at the Zurich Polytechnicum, and at the École des Beaux Arts, Paris. *How* are they taught? Such is the question we shall try to answer, by sketching the artistic life of a Parisian *atelier*, and the laurels that life leads to.

Plato, Aristotle, and most Greek thinkers were of opinion that learning should be the result of *debate*, and that a dogma only became a truth after winning many victories, and never encountering defeat. Frenchmen adopt that view with respect to artistic education. They hold that genius can reach perfection only when helped by experience and copious criticism. An aspiring artist, they think, should have hourly intercourse with other artists bent on aiding him in his artistic efforts. The Paris world of art-students and the Paris *ateliers* are the upshots of that belief.

An architect's *atelier* in Paris is, so to say, a private club of students of architecture. The master of the *atelier* is an architect of fair standing, perhaps a *Grand Prix de Rome*. The elect of the students, it is his mission to direct and counsel them in their architectural pursuits, and to work them up for the *Grand Prix de Rome*. Nothing can exceed the fatherly anxiety of the "patron" (the master's title) for his pupils, who are, indeed, his intellectual children, and the trustees of his artistic past. A Parisian *atelier* is a republic of young artists ever anxious to rival the bygone triumphs of their predecessors, and to break new ground. The students are grown men, but as disinterested as poets. They love ideas for their sakes; the artistic muse for her sake: they are not practical. For them an art is an art—not a trade. Many a poor student has found poverty sweet in the fancied halls of his imagination. Many a poor student does the night-drudgery of some flourishing Paris builder, in order to have the day to improve his taste and learning with his comrades of the *atelier*.

The teaching is mutual: the fresh men are instructed by the old stagers in exchange for their handiwork. Thus, a fresh man gets practice over the plans of an older man, and the boon of his advice; while the advanced student can strike out the most ambitious designs, backed as he is by a staff of half a dozen juniors. So, by mutual co-operation, both tiros and veterans are equally benefited.

The students mix on terms of familiar equality. A constant exchange of opinions fills the pupils' minds with ready and varied knowledge. As a consequence of this commonwealth life, the *atelier* has a commonwealth spirit. "*Unus pro omnibus, omnes pro uno*," such is the watchword to which few students ever play false. And yet the rivalry of Paris artists is fierce, though self-giving. Every man tries his utmost to win, but is bound by the rules of the *atelier* to help others on to victory.

Every *atelier* rejoices in triumphs and memories of its own. One artistic generation after another is drafted into active life; "patron follows patron," but the old spirit is ever brooding its old devices within the old walls of the *atelier*. Thus, conservative and progressive, each *atelier* strives to hold its own under the banner of its past. Hence the keen competition between *ateliers* for the *Grand Prix de Rome*, the greatest prize that France can offer her artistic sons.

And now a few words about that studentship. The man who is proclaimed *Grand Prix* by the examiners (see *Builder*, Jan. 22), may go and pend four years in Rome or Athens, at the expense of the French Government. If in Rome, he takes up his abode at the Palace of the Medicis, which now belongs to France.

But wherefore these Roman pilgrims? What comes of their musings in the interest of art and France? We shall answer those questions by quoting from M. Garnier's* book, "À Travers les Arts." The astute critic, speaking of contemporary French art, says:—"The present period is the architectural period of *truth*, not that of *original shams*. The inside of a building is what its outside tells us it should be. If we look at the ornaments, which are to an edifice what expression is to the human face, we can trace back their genealogy to Greek art, though they often smack of something which betrays the individuality of a nineteenth-century man. They are not copies of a justly-admired style, but new modes of rendering it. The Grecian muse has breathed into us her vital spark, and harmonised our conceptions;—but the conceptions are ours, French art ours. Greece finds perfection, but France fashions it to her genius and her needs, and, by that expansion of Grecian originality, claims an originality of her own, none the less meritorious for its Grecian lineage. Our forefathers worked a Renaissance out of Roman art. We think that modern France is destined to generate a yet more comprehensive revival, which will be the fruit of our minds rather than that of our traditions. All sound reformers must be sound historians. So we see that the men who have done most for *French* art, have been most learned in *ancient* art. At Rome it was that Duban, Labrouste, Duc, Vaudoyer, Baltard, and others grasped the past with one hand and pointed to the future with the other. At Rome the *Grand-Prix* men gather, at the hands of the great masters of old, materials for judicious innovations. One might almost say that old Rome has built modern Paris."

At a dinner given last year by the *Atelier Lebas* to the *Prix de Rome* of former years, the bills of fare were ornamented with the following suggestive design. In the foreground, the *Atelier Lebas*, and in the distant background, *Rome*. That design typifies art-education in France. It means years of labour, and, in some cases, years of privation, in order to secure the highest art-training the old masters can give. It means enthusiasm for *the beautiful* and *the ideal*, and a determination to prefer them to all material interests. It means the far-sightedness of a people who are aware that, next to religion and philosophy, art is the greatest civiliser that ever came from God to man.

LAWRENCE HARVEY.

École des Beaux Arts, Paris.

* Grand Prix de Rome, Architect of the New Opera House, Paris.

THE SEWAGE QUESTION.

A LECTURE on this question has been delivered in the Philosophical Hall, Leeds, by Mr. Filliter, C.E., resident waterworks engineer to the Leeds town council. The attendance included the mayor and several members of the corporation. In illustration of his lecture, Mr. Filliter had prepared an extensive series of diagrams, and to these he made constant reference.

In the course of his lecture he said, a belief had of late years been gaining ground that separate sewers would have to be made for rain-water and sewage, and in an official report, lately presented to the Home Secretary by Col. Ewart, on the drainage of Oxford, Eton, Windsor, and Abingdon, he had recommended this course to be adopted. This point was likely, ultimately, to prove the key to one part of the sewage difficulty. As, however, Leeds and its sister towns were sewered on the joint system, and as a change to the separate system would be costly, and not likely, therefore, to be readily made, Mr. Filliter proceeded to describe the known methods of dealing with sewage as it actually exists. These he divided into two principal groups,—first, those which endeavoured by mechanical or chemical means to remove the offensive matter, in order to convert it into solid manure, which might be classed together as "Sewage Manure Methods;" second, those which took the sewage direct to land, and attempted at once to purify the sewage, and abstract its manurial elements by placing it in contact with earth, which might be denominated the "Sewage Irrigation Methods." There were other methods of dealing with refuse matter, amongst which he mentioned the Eureka system, as formerly tried at Hyde; Dr. Bishop's plan, once in use in Leeds; and the Moule's earth-closet system. He scarcely considered these as being within the scope of his paper, but he believed this part of the subject to be well worthy of grave consideration; for upon further investigation it might, after all, prove simpler and better not to allow house refuse to become sewage at all, rather than to attempt to purify and utilise it when so made. In illustration of the simplest method of purifying sewage,—namely, by deposition,—the lecturer stated that the sewage of Leeds would fill a reservoir eight acres in extent and 5 ft. deep every day, so that a week's storage would require at least sixty acres of land, or a tract about the size of Woodhouse Moor.

Having mentioned the methods commonly adopted for obtaining a solid manure out of sewage, Mr. Filliter proceeded to describe the various systems of irrigation. It was found, he continued, that the sewage of about 100 persons might be utilised on an acre of sewage meadow, and that the effluent water was tolerably pure and free from offensive odour. Having spoken of this plan, as practised at Harrogate, Croydon, Warwick, Edinburgh, South Norwood, Birmingham, Barking, and other places, he said that, supposing Leeds had to irrigate, he found that they would have to carry a conduit past Knottingley, where there was almost any quantity of sandy land. If the farmers there objected to use the sewage, we might go to Thorne Waste, where, on a tract of 5,000 acres, practically worthless, we might demonstrate its value. The great drawback to this scheme was that Thorne Waste was twenty-seven miles away, and as it would involve a conduit twenty-seven miles in length, it was a grave question. How far irrigation had succeeded in a pecuniary point of view he could not confidently say. Its advocates adduced remarkable examples of heavy produce and large receipts, but it could not be forgotten that these were produced upon land which had cost much to put into shape, and required much to keep it in working order. Without in any way ignoring the success and apparent superiority of the irrigation system, it seemed to him that purification by deposition presented in some cases actual advantages, combined generally with prospects hopeful enough to warrant further experiment, by the engineer and analytical chemist working together. It was still open to grave question whether sewage, as we know it, ought to be allowed to be formed at all, and this view of the subject ought not to be lost sight of. In conclusion, he remarked that no single system could be held applicable to all towns and all localities. The several circumstances of each place, as to situation, as to level, as to temperatures, as to rainfall, as to markets, and many other matters, must be duly weighed and carefully regarded in devising any proper sewage scheme for that place.

Mr. Edward Smith, F.C.S., &c. (of Torquay), in a paper on "The Chemistry of Sewage," recently read before the Torquay Natural History Society, reviewed the question of the profitable application of sewage to the land. He referred to the immense national loss of the present wasteful system, and after declaring the inadequacy of irrigation, urged the necessity of preserving the excreta of towns, and mixing them with deodorising material, and points out a method by which this important object, he thinks, may be carried into effect:—

"We now come to the consideration of the application of the excreta in a solid or non-fluid state to the land, popularly known as the 'Dry Earth System.' I am not aware that a single objection can be made to the principle of direct application of excreta to the soil. As I have previously stated, the great difficulty hitherto has been the want of a suitable absorbing material. Dry earth is not sufficiently absorbent to enable us to apply it economically on a large scale, although at Wimbledon during the very hot weather, it was the only system that succeeded. . . . . .

Mr. C. Stanford, F.C.S., an able chemist, has suggested that sea-weed char may be used as an economical and efficient substitute for dry earth. He has made some experiments in this direction, and finds that while perfectly dry earth absorbs 45 per cent. of water, sea-weed char absorbs 147 per cent.; the former becoming a sludgy mud, whilst the latter can be easily removed.

The mixture of sea-weed char and excreta, when removed and placed under cover, soon dries without producing the least nuisance. It can be stored for any length of time, and used again several times."

At a meeting of the Committee of the British Association on the Treatment and Utilisation of Sewage, at which there were present Mr. Grantham, C.E. (in the chair), and others, the honorary secretary presented the list of subscriptions from the various towns contributing towards the expense of a practical and comprehensive inquiry into the

treatment and utilisation of sewage. He reported that he had addressed the circular to 663 corporations and boards of health, and received replies from 245. The subscriptions amount to 786*l.*, exclusive of the 50*l.* given by the British Association. Of those towns and districts which replied to the circular and did not contribute, 25 deferred their decision for consideration, and 23 merely acknowledged the receipt of the application without any intimation as to their intentions; while the remainder, amounting to 116, refused on various grounds, some because they thought the inquiry ought to be conducted at the expense of the country generally, and some because, though they approved of the inquiry, they were too poor to contribute. The committee, after a careful consideration of the matter, was of opinion tnat the amount already subscribed was sufficient to justify the commencement of the inquiry, but that unless a larger number of places joined in contributing, the inquiry would not be sufficiently extended.

THE SOUTH KENSINGTON SCHOOLS OF ART.

THE prizes to the students of the South Kensington Schools of Art have been distributed by the Prince of Teck. Mr. Cole, C.B., who conducted the party into the new lecture theatre, said that Earl de Grey had found it impossible to be present. The Art School of South Kensington was one of 110 art schools in the kingdom, but these were partly supported by subscriptions, while the students' fees at South Kensington paid the expenses of the school. He regretted that the students did not make more use of the museum, which was an advantage such as none of the other schools possessed. About 150,000 students now attended these various schools, which cost about 1*l.* per student,—a very small sum in the aggregate when compared with the commerce of this great country.

The medals and other prizes distributed were won in the national competition of 1869, and the works to which they were awarded were executed in the twelve months preceding the April of that year. The medals and books distributed represented only the highest grade of distinctions obtainable by students, male and female, and consisted of three gold medals, and the Princess of Wales's Scholarship of 25*l.*, six silver medals, 12 bronze medals, and 21 Queen's prizes of books, all won in the national competition, besides 29 prizes of books, and 22 free studentships, won in the elementary or local prize section. This included the whole of the prizes gained at the great annual competition. At the second grade examination in March, and which consisted of examination by written papers in geometry and perspective, and exercises in freehand and model drawing, 120 students "passed," 36 won "prizes," and six obtained "certificates." At the third or highest grade examination, 13 students obtained the teacher's certificate. Besides the above regular prizes and distinctions, occasional prizes have been offered by the Department and by manufacturers during the year, some for general competition, and some only for this school. The Worshipful Company of Plasterers offered prizes of 25*l.* for designs for a "Truss," and an "overdoor ornament," limiting, however, this school to one subject: two students obtained the prizes of 8*l.* 8*s.* and 5*l.* 5*s.* respectively. Messrs. Corbière offered during the year prizes of 5*l.* and 10*l.* for designs for silk fabrics and for paper-hangings for manufacture in France. Besides the works obtaining these prizes others were purchased to the amount of 18*l.* 5*s.*, and most of these works have been produced in France for the French market. Since the last distribution of prizes, 16 male and 6 female students had been admitted to the schools of the Royal Academy. One student (W. R. Bromley) from the school here had this year obtained the Royal Academy silver medal for the "figure from the antique." In the half-year ending February 29, 1864, the number of students was 382; the amount of fees, 878*l.* 11*s.* For the half-year to end February 28, 1870, the number of students is, at the present time, 766, and the amount of fees, 1,363*l.* 11*s.* Of the number of students, 470 are males, and 296 females: 199 are free students. Of the 103 schools competing, these schools took 3 gold medals out of 10, 6 silver out of 20, 12 bronze out of 51, and 21 Queen's prizes out of 102.

Mr. Redgrave addressed the students, and said that one of the principal objects of the school was to elevate the general taste, and to make, not art-students, so much as students useful to manufacturers. They ought to study the works which others had done, not to copy them, but to stimulate their own invention and to enable them to conceive others in the same spirit.

Of the prizes distributed the following were the most important in the female school:—Gold medal and Princess of Wales's scholarship of 25*l.*—Marianne Mansell, design for porcelain. Silver medals—Edith Edenborough, monochrome, in oil from antique; Kate Greenaway, head from life, water colour. Mr. Cole specially mentioned a bronze medal for a "time sketch" by Edith Edenborough as an example of rapid execution only to be gained by hard and patient study. In the male school.—Gold medals—William Walter Oliver, drawing from antique; Harry S. Palmer, group, water colour. Silver medals—Charles Edward Black, head from antique; Joseph Harris, design for lace; Edward Charles Slocombe, design, hangings and jewelry; Thomas W. Wilson, design for tiles. A number of bronze medals and of books were also given. At the close of the distribution,

The Prince of Teck congratulated the successful students on what were their rewards for past work and their encouragement for the future. He was glad to perceive that the study of art was placed within the reach of all classes in the kingdom, and he thought we ought to feel deeply indebted to those who facilitated this teaching, which was of value not only to the country but to the whole world. It was also pleasant to observe that some of the designs of the students had been purchased by French manufacturers. He rejoiced to see that a convention had been made for the interchange of reproductions with foreign museums. It was impossible to visit the museum of South Kensington without being reminded of one who had been a great promoter of art and science in the country—the Prince Consort. It must be a satisfaction to Mr. Cole, who had worked to aid the prince, to know how fully these schools realised the prince's wishes.

FARMING COVENANTS.

AT the ordinary general meeting of the Institution of Surveyors, on February 21st, Mr. John Oakley, in the chair, a paper on this subject, by Mr. Elias Pitts Squarey, member, was read.

The principle which ought to govern farming covenants would seem to be, that the tenant should have the freest and most unrestricted use of the lands and premises, consistent with the maintenance and yielding up of the freehold at the end of his tenancy in an unimpaired and uninjured condition; and the object of the paper was to indicate the relaxations and modifications, in whatever direction, which appear likely to conduce to increased production without injuriously affecting the interests of the landlord, and to deal with the separate questions of rent, covenants as to cropping, repairs, and entries between outgoing and incoming tenants.

We give his observations under the head of *Repairs*:—

"Repairs are a large and important feature in farm agreements, and probably lead to more questions, troublesome of solution, between the landlord and tenant, than any other condition of tenure. The ordinary arrangements are,—

1st. Where all repairs are borne by the landlord.

2nd. Where all are borne by the tenant.

3rd. Where the landlord provides the materials and the tenant pays the labour.

4th. Where the landlord finds the materials and shares with the tenant the cost of labour.

It is obvious that these varied conditions proportionably affect the rent which is payable, and theoretically it would seem to be of little importance by whom the necessary reparation is made; practically, however, it is far otherwise. Left to themselves, and without any liability to made good the wear and tear which inevitably happens to farm buildings, the tenant is too frequently careless of the cost of these repairs, and permits waste and injury to his premises, which, had he an interest in their economical maintenance, would never arise. On the other hand, where the entire onus of repair is thrown on the tenant, he is too much disposed to evade, as far as possible, his liability: hence things go undone, which, trifling in themselves at the outset, by the end of a long occupation, assume very serious proportions. Arbitrations or legal proceedings are frequently necessary for their settlement, and it is exceptional if, in such cases, the tenant is not relieved of a portion of the liability which, directly or indirectly, should properly fall upon him. For myself, I am inclined to the belief, that the fourth adjustment of the liability, *i.e.*, the division of the cost of labour by the landlord and tenant, most fairly meets the difficulties of the case.

The tenant's proportion of expenditure is limited to an amount which is more than balanced by the comfort and advantage of the maintenance, in proper condition, of his premises; and to avoid the large liability which is certain to result from neglect of prompt repairs, he will certainly be continually pressing on his landlord or agent the necessity for keeping things in good order.

Let me suggest, as exceptions to the materials to be provided by the landlord, straw for thatching, and glass and leadwork; further, the tenant should be bound to do the carriage of materials for repairs within reasonable distance. As with land, so with buildings, dilapidations at the termination of a tenancy should be more strictly enforced than is now the usual custom; but it is clear that the tenant should be only liable for a legitimate and necessary reparation, and not for restoration or reinstatement."

A discussion, in which several members took part, followed the reading of the paper, and was adjourned to Monday, March 7th.

LORD BACON AND THE ENCLOSURE OF COMMONS.

AT the present time the following scrap from the pen of the "wisest of mankind" may possibly have some interest. Francis Bacon desired to acknowledge his obligation to the Earl of Essex; but also desired to decline being mixed up with any folly or extravagance in which that headstrong young nobleman might desire to involve him; and concludes a letter to him thus:—"For your lordship I do think myself more beholding to you than to any man. And I say I reckon myself as a *common*. . . . And as much as is lawful to be enclosed of a common, so much your lordship shall be sure to have."

This is an extract from "Spedding's Letters and Life of Lord Bacon."* The author infers the following paraphrase:—"You can have for your own share only 'so much as is lawful to be enclosed;' that is, I can only offer you such services as can be lawfully rendered by one whose chief service is due to the State."

G. M.

THE LABORATORY, ETON COLLEGE.

THIS is a building necessitated by the increased importance wisely given to science at Eton since the appointment of Dr. Hornby to the headmastership of the school.

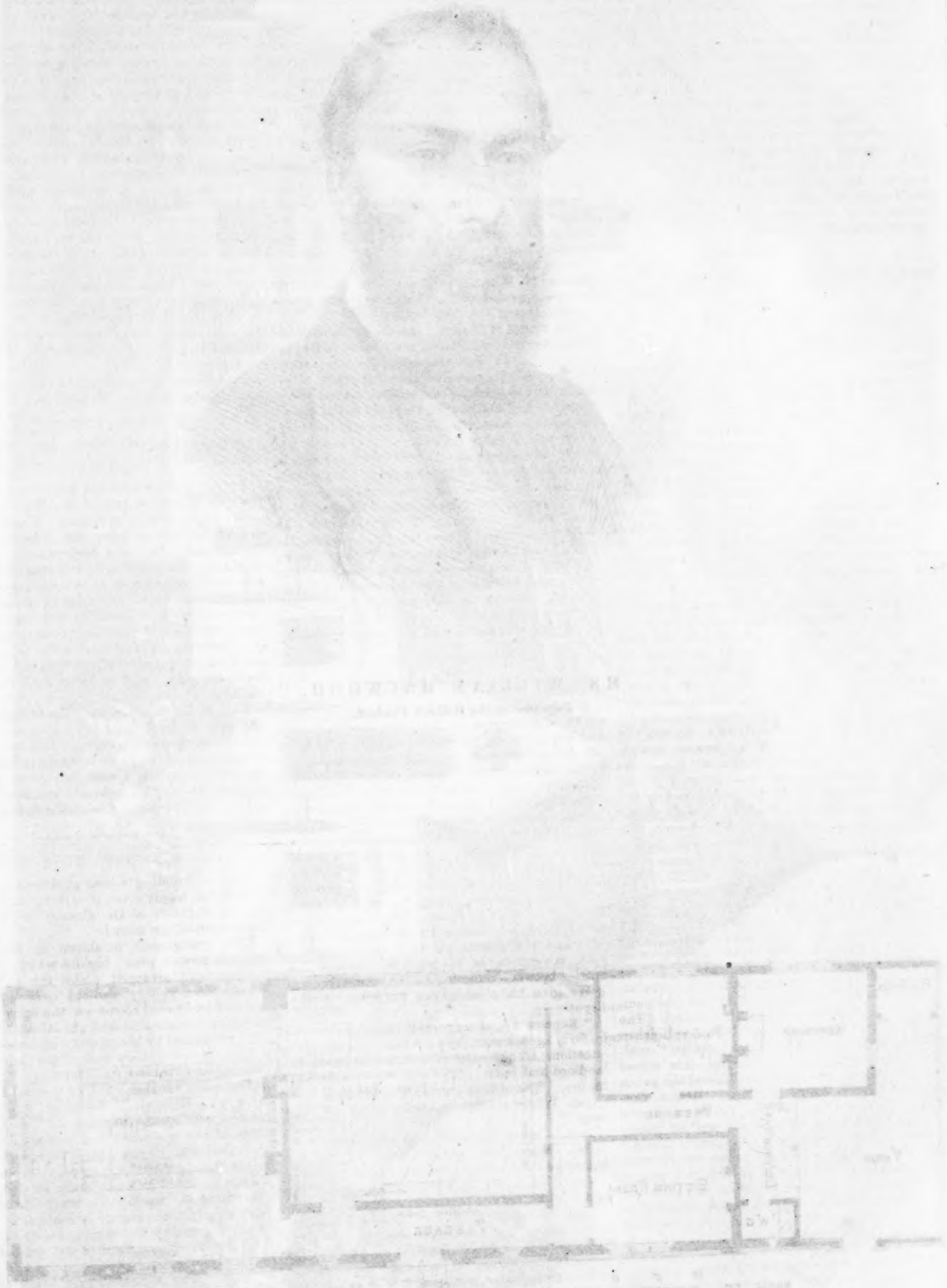
The arrangement is shown on the accompanying ground plan; besides which, there is a heating-vault arranged under the end of the lecture-room gallery, vaulted over with brick, and two additional rooms on the upper floor for purposes in connexion with the laboratory, which are approached by the passage staircase, and by a door at the gallery end of the lecture-room opening on to the staircase landing.

The walls of the building are of local red brick, with Bath stone dressings; the roofs are covered with brindle-coloured Staffordshire tiles, those of the laboratory and lecture-room being open-timbered. Special attention has been paid to the arrangement and general detail of the fittings, in order to make them as suitable and convenient as possible for their intended purposes; and in the matter considerable thought has been given by Mr. Madan, Fellow of Queen's College, Oxford, and head of the science department at the school.

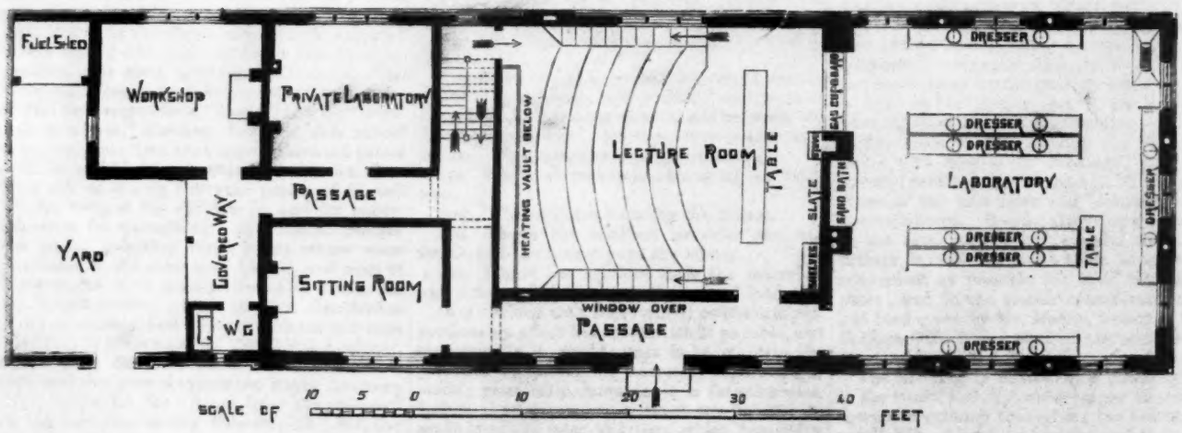
The building is heated by a boiler apparatus in the vault, and hot-water pipes in connexion therewith running throughout the building; the ventilation of both laboratory and lecture-room has been well provided for; and provision is also made by means of pipes acted upon by gas jets for the purpose of more effectually carrying off the gases occasioned by the chemicals.

The architect is Mr. William Wilkinson, of Oxford; and the builders are Messrs. Fassnidge & Son, of Uxbridge, who are also supplying the heating apparatus. The cost of the building, exclusive of the fittings, will be about 2,000*l.*

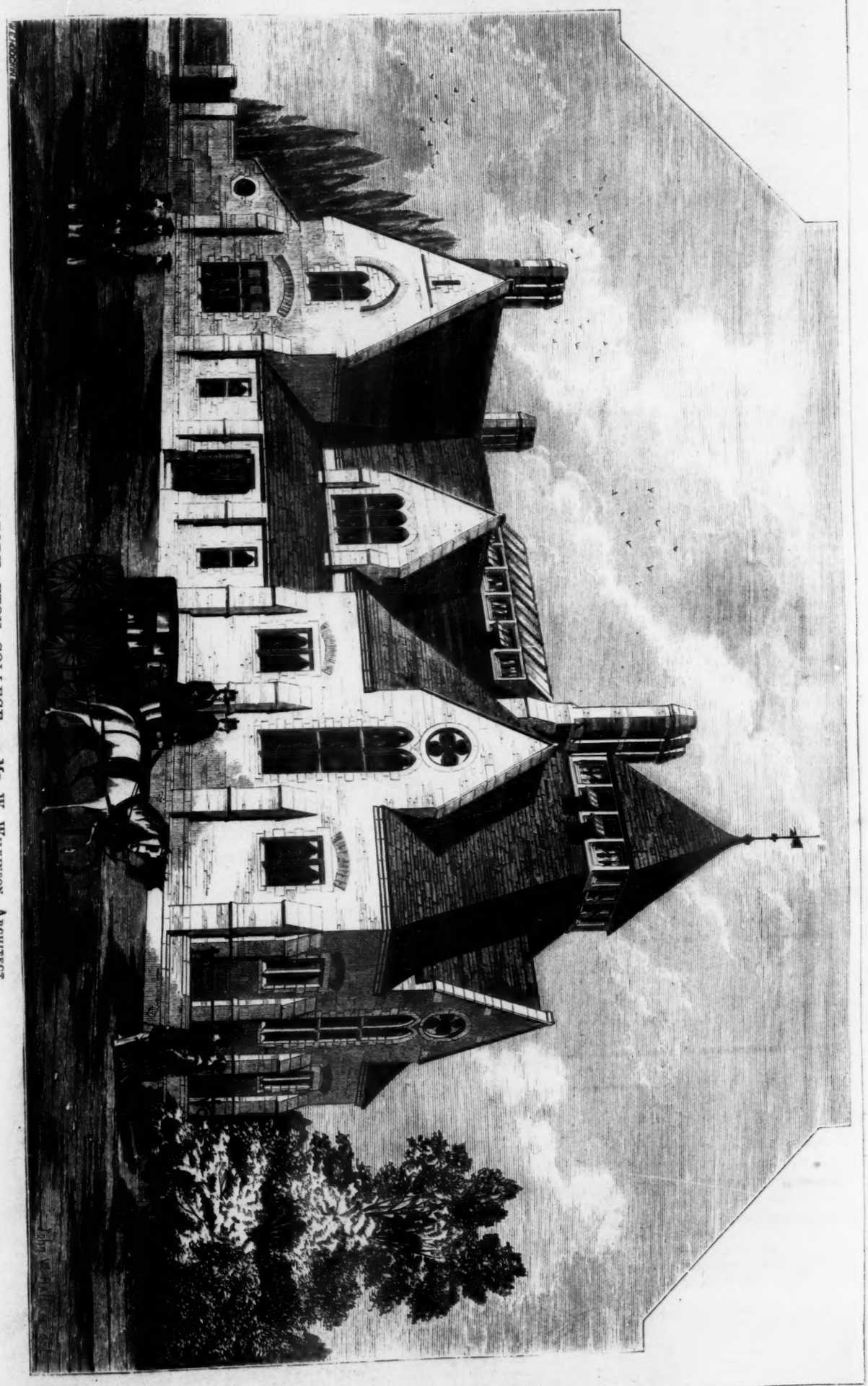
* Vol. i., p. 373.



MR. WILLIAM HAYWOOD,
Engineer of the Holborn Viaduct.



THE LABORATORY, ETON COLLEGE.
Plan.



THE LABORATORY, ETON COLLEGE.—Mr. W. Wilkinson, Architect.

THE HEALTH STATISTICS OF LIVERPOOL.

AT a recent meeting of the local health committee, Dr. Trench, the medical officer of health, presented his annual report, which set forth that during the 52 weeks of the year 1869, terminating on the 1st January, 1870, the returns of the local registrars recorded 18,668 births and 14,744 deaths within the borough of Liverpool. Of the births 9,467 were males and 9,200 females, making the total birth-rate for the borough equal to 36·6 per thousand. Of the 14,744 deaths, 7,588 were males and 7,156 females. The death-rate of the borough was equal to 28·9 per thousand, or 3 per thousand less than the average rate which had prevailed during the previous ten years. The death-rate of the parish was equal to 31·6, and that of the out-townships to 25·8 per thousand of the estimated population. There were at the last census, in 1861, 60,760 children under five years of age within the borough of Liverpool; the number might now be estimated at 69,672; and therefore their mortality in 1869 was equal to 10·5 per cent. of the whole; 4,461 infants, or every fourth child born within the borough of Liverpool died before attaining the age of twelve months. Zymotic diseases occasioned 4,238 deaths during 1869, and this accounted for 28·7 per cent. of the total mortality within the borough. This was nearly 1 per cent. less than the proportional rate of zymotic deaths to deaths from all causes during the preceding decennial period. Typhus and remittent fever accounted for 783 deaths, or 542 in the parish and 241 in the out-townships—a rate equal to 1·5 per thousand per annum of the estimated population. Under the head of "sanitary work" reference is made to the conversion of privies into water-closets. It appears that to the end of 1868 there were 13,391 privies so converted, and, during 1869, 1,857; so that the work was nearly done. As to registered lodging-houses, the number in the borough at the end of 1869 was 1,149. In addition to over-crowding—for which 549 persons were brought before the magistrates, and fined in sums varying from 1s. to 10s. and costs—the offence of permitting adult males and females not married to occupy the same room came under notice, and was entered in the books of the inspector. There were 365 rooms found to be thus occupied by 649 males and 691 females; and there were also in these rooms 139 children between the ages of five and thirteen years. The medical officer expresses an opinion that the Workshops Regulation Act, however beneficent in intention, is not only impracticable in its machinery, but inequitable in its effects.

CASES UNDER THE BUILDING ACT.

WE have received the following letter:—

Sir,—We are instructed by Mr. George Willsmer, of Vicarage-road, Leyton, Essex, to call your attention to the paragraph in your paper of the 5th inst., entitled "Cases under Metropolitan Building Act," and purporting to be the report of a case before Mr. Ellison, at Worship-street.

There is a sentence therein as follows:—"A fresh notice was given in October following by Willsmer, of Old Ford-road, for proceeding with the works, and the houses were covered in the same month." The report then runs,—"The houses remained unfinished for some time, and the builder Willsmer could not be found."

The last sentence which we have quoted was not in evidence before the Court, and is untrue. Mr. Willsmer complains that it is to be inferred from the report that he has gone out of the way, whereas, upon inquiry made at his late place of residence, he could easily have been found.

The report has injured Mr. Willsmer's credit with persons from whom he has been in the habit of buying goods, and on his behalf we have to request that an apology for the insertion of the paragraph complained of be sent to us, and that a contradiction of the statement be made in two successive issues of your journal, such contradiction to be approved by us. We may add that a similar case to the one reported was heard at the same Court a few weeks after the one reported by you, and, upon the magistrate deciding in favour of the surveyor, a case was granted for the opinion of the Court of Queen's Bench upon the legal point involved in the decision.

We have only to add that, in the event of Mr. Willsmer's reasonable request not being complied with, he will take such steps, with a view to clear himself from the prejudical inference from the report, as he may be advised.

Yours faithfully,

APPLEBY, WRIGHT, & CROWTHER.

We have every reason to believe that the brief report we gave of what took place is correct. The district surveyor informs us, in reply to an inquiry, that he said in court he had endeavoured to find out where Mr. Willsmer had gone, but could not succeed, and authorises us to refer Messrs. Appleby, Wright, & Crowther to him. Our report is a dry statement of what we believe took place, without a tinge of *animus* of any kind. We know nothing whatever of Mr. Willsmer, and have not the remotest desire to do him any injury. We are quite willing to believe the statement that he would have been found if he had been properly looked for.

DECISIONS UNDER THE METROPOLITAN BUILDING ACT.

MESSRS. EBBS & SON, builders, of 9, Northwicke-terrace, were summoned before Mr. Mansfield, by Mr. Alexander Peebles, district surveyor of North St. Marylebone, to show cause why they refused to pay the sum of 4*l.* 15s., the fee for surveying an alteration to the external wall at the nave end of the English Presbyterian Church, at Marlboro'-place, Abbey-road, executed after the church had been roofed in.

Mr. Joseph E. Turner, solicitor, appeared for the district surveyor; Mr. Ebbs appeared in person.

The facts of the case, as proved by the evidence, are as follow:—

The notice for the erection of the church was given on the 30th of April, 1869, and about the end of the third week in October the roof was slated over, with the exception of a space of about 5 ft. at the tower end, which was left unslated for the passage of the scaffolding for the tower, then in course of erection. The wall in question was originally intended to be, and was built up as, a blank wall, some time before the roof was covered in. After the roof was covered in, four windows were cut away for in the blank wall in order to improve the effect of the church. The windows consisted of three single-light openings, surmounted by a large wheel or rose window.

Mr. Turner contended that the roof having been covered in previously to the commencement of the alteration, and the alteration affecting the construction of an external wall, the Special Rules of the 13th section of the Act came into operation, and the district surveyor was entitled to the further fee provided by the first part of the 2nd schedule to the Act. With reference to the part which remained unslated, he contended that this portion of the roof was immaterial; that the roof, as a whole, had been covered in within the meaning of the 9th section of the Act, and that the small opening left for the scaffolding could not be said to prevent the building from being covered in within the meaning of that section. An offer of compromise had been made by Mr. Peebles, but refused by Messrs. Ebbs.

Mr. Ebbs, on the other hand, contended that inasmuch as the space of 5 ft. had been left unslated, therefore the church had not been covered in within the meaning of the section, and the district surveyor was not, therefore, entitled to a further fee.

The Magistrate took the latter view, and said that although the church might otherwise have been completed and used for religious services, yet, if a part of the roof had remained uncovered, he should not consider the building to have been roofed in within the meaning of the Act.

CONDITION OF THE BUILDING TRADE.

SIR,—I have read in your paper, and I know myself, that thousands of building artisans are out of employ. I believe I may say there never were so many out of work at one time before; and yet I have just now seen the following statement in a newspaper:—

"The joiners of Glasgow have resolved that on and after the 1st of March they will have a half-penny an hour more than at present, and that they will only work nine hours a day."

How are the two statements to be reconciled? I am a dealer in corn, and always find that when there are more sellers than buyers I have to reduce my price, and wait for better times before I raise it. ECONOMIST.

Your correspondent, "Trying Plane," if he reads my letter carefully, will see that it applies to working men, and not foremen; and that 8d. per hour is the mean, and not the extreme, price paid. He quotes Adam Smith; but there is nothing in Adam Smith more evident than the uncontrollable influence of supply and demand. Your correspondent's list of his requirements is amusing. Why not allow his wife a pair of dapple-grey ponies? It would be as reasonable as to expect what he enumerates, when the demand for labour is so depressed as to compel very many to leave the country, whom every sensible man would wish to retain. Adam Smith's observations as to over-strained profits are very true; equally so his observation that high-priced labour can be well supported when a nation is "growing rich." The present argument is, whether high-priced labour can be supported when the country is not "growing rich," and when the supply of first-class labour very much exceeds the demand. No man who really studies the subject begrudges the payment of high wages in prosperous times: it benefits the man that receives them, and the country generally by the increased money the workman has to spend. But there comes a time when every trading interest is depressed; when a man cannot sell a house for any amount approaching the money which it cost to build, and in a large proportion of second-rate property. Then crops up the question at issue, viz., whether a combination of working men can protect themselves from the inevitable effects of "supply and demand." This subject is worthy of ventilation by an abler pen than mine, but your correspondents would do good service if they could satisfy the simple inquiry, "Whether a man requiring the highest rate of wage in prosperous times and depressed times, accepting the natural consequence of being out of work under the latter state of circumstances, would in a twelvemonth receive more money than the man who accepted work at the best price the state of trade would afford." If, taking this inquiry over a large body of men, the first proves to be the case, there may be some justification for a uniform rate of high wages; if the other, 8d. per hour uniform rate is not so high in point of advantage as submitting to the natural influences of "supply and demand." SENEX.

SIR,—I have followed with much interest the correspondence on the above subject, and your impression of the 19th shows some of the reasons why the trade is in the state it is. On page 144, there is a letter signed "Trying Plane," which appears to be from a joiner who prefers to be idle rather than work for less than 8d. per hour.

On page 155, we see that the plasterers in Mr. Aldin's employ have struck rather than work for 7½d. per hour. These instances show that the working classes do not yet perceive that they must accommodate themselves to the times, although their employers are forced to do so. The competition to obtain contracts is far too great for much profit to be made; and I should like to know how many master builders have done more than pay their expenses during the last two years, while we know that many have not been able to do that.

There are many clerks and others,—men who have received good education,—who would thankfully accept situations, if they could get them, at salaries far below what they feel they are worth; and our working-classes must look for employment in the same spirit.

The building trade is now in a deplorable condition, and in my opinion will be worse, so far as the operatives are concerned, before it gets any better. It will have to go through the same process that the cotton, and steel, and other trades have had to submit to, and the skilled workmen must be prepared to see mechanical appliances introduced into the building of the future to a much larger extent than heretofore.

Architects and builders must turn their attention to labour-saving apparatus in every branch of the trade, so as to bring the cost of building down to a rate that will induce the public again to invest in this class of property. The efforts recently made to introduce concrete houses seem steps in the right direction. IRON.

*** We have received a dozen other letters on this subject, to some of which we may give further consideration.

THE TRAMWAY BILLS.

NOT only is the metropolis to be interlaced with tramways, if the numerous projects in hand be carried out; but in probably every large town in the country, tramways are the talk. That a revolution in town transit is on the eve of taking place, is evident; and it will be for Parliament to see that the inevitable change is discreetly and properly carried out.

The propriety or desirability of handing over portions of our great thoroughfares to private companies, as proposed, has been questioned; and although we are altogether in favour of tramways, this, we think, is a question well worthy of careful consideration. But if private companies are not to be allowed, under any circumstances or conditions, to interlace our thoroughfares with tramways, public authorities ought to be compelled to do so on some consistent and continuous plan. In the metropolis, especially, where there are so many different, and not interdependent, authorities, supervision and a gentle compulsion would especially be requisite.

Mr. William Booth Scott, C.E., the chief surveyor to the St. Pancras Vestry, reported on the subject to his constituents so far back as February, 1868, and again in the present year. The conclusions of his elaborate report just printed, are of public importance; and we may here give them in a more or less condensed form. Admitting the expediency of tramways, he is of opinion—

That they cannot be laid and worked upon roadways of great traffic, "so as not to impede or injure the ordinary traffic of the streets."

That it would be inexpedient to permit companies of private individuals to lay tramways upon public thoroughfares, as by so doing they would usurp a right to control the use of the thoroughfares by the community at large, and would virtually establish a gigantic monopoly of the passenger traffic.

That it is possible to devise and carry out a comprehensive scheme of tramways for the metropolis, so that the community at large may reap all the advantages, while by proper and undivided management the inevitable inconveniences might be reduced to the minimum.

That the only satisfactory mode of thus dealing with the matter would be by the institution of a corporate body, to be called, say, the Metropolitan Tramway Board, upon whom would devolve the duty of devising, constructing, and managing such comprehensive scheme, and extending it from time to time.

That the privilege of running cars upon the tramways so constructed should be put up to competition and let by tender annually, or for terms of years, upon terms and conditions defined by the Metropolitan Tramway Board.

That the revenue derived would not only (rapidly) defray the cost of constructing and maintaining the tramways, but would also produce so large an annual surplus as to reduce the general or paving rate at least one-half over the whole metropolis.

That companies of private individuals ought not to be permitted to establish a monopoly, and appropriate such an immense revenue by the use of the public thoroughfares, but that the revenue should be reserved to the community at large.

That the whole question should be thoroughly investigated by a Royal Commission.

Mr. Haywood, the engineer and surveyor to the City Sewers Commission, has also reported to his constituents on the subject. Mr. Haywood says:—

"Special consideration will be needed as to how far a company should be allowed to establish what will be, by many, considered a monopoly of portions of the public highways. The objections on this point have, however, been already raised before Parliamentary Committees, but have not been thought, in respect of the Metropolitan and Liverpool Acts already passed, to outweigh the advantages which the schemes possess; but, if very large benefits

are likely to accrue from tramways as well as large profits to the tramway companies, and there are objections to permitting private companies to construct them, it is a question whether Highway Boards should not themselves form such tramways out of the public rates; and this is a fundamental question at the threshold of the whole inquiry."

The subject has since been mooted in the Court of the City Sewers Commission, and after some discussion the principle of the schemes was approved, and the subject has been referred to the Bridge-house Committee.

A report has also been presented to the Metropolitan Board of Works by Mr. Bazalgette, their chief engineer, in which he says:—

"Amongst the most important of the 36 Bills deposited with the Metropolitan Board of Works for the session 1869-70, are those for the formation of street tramways in various parts of the metropolis. They are seven in number, and are called the Metropolitan, North Metropolitan, London, North London, East London, and the Pimlico, Peckham, and Greenwich (two Bills). The aggregate length of these tramways is about 145 miles; the total capital is 1,174,000*l.*, and the borrowing powers 403,500*l.* Most of the principal streets and roads of the metropolis would be, to a greater or less extent, traversed across by these tramways, and in many cases, the occupation of the same street is competed for by different companies—for instance, Tottenham-court-road, Hampstead-road, and Camden-Town-road, are included in these separate schemes, and the Edgware-road, King's-cross, Holloway, Islington, City, Camden, Blackfriars, and Westminster Bridge roads, and Whitechapel and Aldgate High streets, are each proposed to be invaded by two different companies. Four bridges are to be crossed, namely, Blackfriars, Westminster, Lambeth, and Vauxhall. I have on previous occasions expressed the conviction that, 'If tramways are to be adopted in London, it would seem desirable that some uniform system should be laid down under the direction of this Board, rather than it should be left to the discretion and management of private companies, whose interests would be likely to clash with those of the public and with each other.' I am fortified in that opinion by experience of the excessive expenditure which has been incurred in this country by the formation of railways by rival and competing companies instead of having a system of lines selected under some impartial jurisdiction to be executed by private companies; and I am still of opinion that it is undesirable in haste to multiply the tramways of London without having obtained experience as to their efficiency and advantage to the public."

It is to be hoped that Parliament will give the whole question, how best to establish tramways in the metropolis and other large towns, all due consideration before a single Bill is allowed to pass. The subject, we understand, is under the consideration of the Board of Trade. In the House of Lords, Earl Grey questioned the propriety of leaving the proposed tramways in the hands of private companies.

THE OXFORD SLADE PROFESSOR OF ART.

IN Mr. Ruskin's second lecture in the Sheldonian Theatre, Oxford, he said art has a three-fold relation to religion. We must consider how far, first, it is literally inspired by religion; secondly, how far exalted by it; and, thirdly, how far it has advanced the creed it advocates. If we analyse imagination we shall find that divine light, of which we all have a share, has affected the creations of all great artists; but the achievements of art have never been the result of inspiration, but of labour and of those feelings which influence all humanity. There are three essentials to all good work of art. 1. An instinct of construction, which is not enjoyed alone by man, but is shared by animals; 2. A faculty of imagination and vision; 3. A power of accurate design. If the second predominate it is usually the result of mental degrangement. An example of this we may see in Albert Dürer's life and death. Some of his visions are unprofitable, unintelligible, and even frightful. A morbid influence spoils his work. This great artist has left us but two works of real didactic value. On the other hand, the best results have been gained by those whose vision was moderated and restrained by accuracy of design. Our best artists are those who are conscious of no divine influence. One of the greatest of them has asserted that all things are possible to well directed labour. Formative art exercises a two-fold influence upon religion. First, in the realisation of conceptions of spiritual persons; 2nly, the localisation of the supernatural presence. Assume, for instance, in the first case the Madonna present to answer prayer: a truly religious mind would desire only so much of her presence as she deigned to give, whereas the superstitious will see before them the actual Virgin. This will affect them in two ways,—first, it will make them believe what they would not otherwise have believed; secondly, it will bring them more frequently under religious influences. The first is evidently mischievous. When art causes us to realise fancy, to believe what is not true, it makes religion degenerate into superstition. If, however, we never lose sight of the fact that it is our imagination which is appealed to, then art is ennobling. The symbolical and realistic are so closely united that in ancient art it is almost impossible to distinguish between them. Now it is easier. It is hard, however, still to say how far symbolical art is improving to mankind. Pictures confessedly imaginary when painted by good men have an elevating tendency, and it is not with these we should find fault, but with the gilded virgins and crucifixes which render superstition a prominent part of the national character. These are pernicious, and to the honour of England their realistic tendencies have been and are discouraged. Lastly, the most notable and lamentable kinds of this injurious tendency is that which encourages people to lament over the sufferings of Christ, instead of alleviating those of his creatures. How much eloquence, music, painting, and sculpture have been wasted during the last 600 years. How is it that, instead of picturing the misery of our Lord, these artists did not remember some of his last words, "Daughters of Jerusalem, weep not for me, but for yourselves and your children." How many women have been led to isolate themselves from the world—to employ themselves in devotions useless to mankind. How much misery might they have alleviated had superstition not perverted their intelligence. One chief reason of the misery of mankind is this division of sympathy with imaginary saints and bad men whose lives ought to have been kept in the background. What might history have been if, instead of living in a cloud of superstition, contention, and revenge, mankind had elevated the good and helped the weak who live among us.

GOVERNMENT WORKS.

SIR,—The more such excellent and practical advice as "T. L. D.'s" is urged on the Government at the present time, so much more will the public at large be indebted to such correspondents. There is no country on the face of the globe that takes so little interest in its public buildings as England. How few public buildings have we worthy of note? How much longer, as your correspondent justly observes, are the public generally to be kept in suspense as regards the New Law Courts, National Gallery, &c.? The sites are provided, and the money paid for them. Here there would be ample means to provide for the necessities of many deserving artificers.

I would not advocate unnecessary extravagance in design for our public buildings, but let them be effective and grand in composition. Who is there that would find fault with Somerset House as a public building? You have fine masses without being overcharged with ornament,—not all adapted to the climate of this country, and which after a few years you find mouldering away, from the effects of soot, and no means of preserving it.

Now, let the Government bear in mind the excellent advice of your correspondent, and at once carry out the designs for the New Law Courts, National Gallery, &c., and provide, or make provision, for so many starving and industrious workmen, and they would secure the goodwill of one and all. AN OLD SUBSCRIBER.

SPON'S DICTIONARY OF ENGINEERING.

THIS work, which has attained to the completion of the Second Division, extending as far as, but not yet completely embracing, the section upon bridges and their construction, is now issued by the publishers in the shape of two separate and uniformly bound volumes. From these the design and general character of the undertaking may be well conceived. The present volumes embody the serial numbers of the work in its current and first-projected form of publication, with brief explanatory statements on the part of the editor, Mr. Oliver Byrne, as to the present progress and ultimate scope over which his labours may extend.

The "Dictionary of Engineering" is not ostensibly projected as a work intended to afford new information upon every subject of which it may treat, as its title in a measure could be said to imply. Reference is freely made to works of well-known authority in special branches of engineering practice; but an impress of originality is conferred upon the present work from the manner in which such references are applied, and the criticism to which, in some cases, they have been subjected. From the contents of the present volumes it might more fairly be apprehended that the Dictionary, when completed, will be likely to form a notable, if not the first, attempt towards the classification of the heterogeneous and widely-spread branches of practical science, upon the treatment of which the work is mainly founded, an effort which, upon its own merits, may in the view of many appear commendable, and has long been expressly called for.

As an instance of the general design and character of the subjects which may be successively commented upon, the treatise on agricultural implements, which occurs in the first volume, may be noted. The mechanical details which are here given as to the construction of the various apparatus of novel introduction and usage in farming, well illustrated and described by numerous engravings and diagrams, are followed up by a comparative inquiry as to the advantages and economy arising in the application of steam-motors and machinery in agriculture. Such an investigation is made to enter fairly within range, and the practical exposition which is given in this the first division, although but one of many subjects enlarged upon, of the successful results which have attended the adaptation of science to farming purposes, could not fail to interest a wide circle of readers, and, in certain directions, to be profitably considered.

When the present work was first submitted to notice, the publishers stated that from careful observation, and from classifying the demands made by professional engineers and the scientific public generally for information in relation to numerous subjects that could not be supplied in any convenient form, they were led to entertain the idea that such a work as the one now issued would prove likely to be useful, not only to the experienced engineer, but to all who are in any way interested in the rapid progress which has been made during the past few years in the successful application of the sciences to the arts.

In the list of subjects proposed to be comprehended in the general undertaking are included those of Railway Engineering, Labour-saving Machinery employed in the different industrial pursuits, Practical Mechanics, Naval Architecture, Mining, Telegraphy, and further researches upon the Strength and Properties of the Materials of Construction.

The treatise on Bridge Construction, which forms no inconsiderable portion of the second volume, and which might probably engage more general attention than intermediate subjects, bids fair to constitute one of the leading features of the entire work.

This section will comprise some portion of the volume next to be issued, and, as proving likely to interest some amongst our readers, we have made reference to it, to the exclusion of more specific branches of art of which the work up to its present point of issue already treats.

In the part to which we refer, a masterly investigation is entered upon, comprising incidentally observations upon the general theory of constructive science, but mainly and speedily resolving into an examination of the structural application of iron and steel.

The rival claims of various systems of suspension bridges which of late years have attracted notice might well suggest an important element of inquiry in such a work as that which is now projected, and we are glad to observe—what we do not remember to have before met with in any work of similar character within general reach—that structures of this class, of surpassing magnitude and scientific interest, which have been erected in America, have received something of that prominence to which they are entitled. It would in no way have detracted from the valuable diagrams given in this portion of the book had fuller references accompanied them. They are, however, clearly and well drawn; and to the professional reader, who may be fairly presumed to already possess acquaintance with some of the works described, less chance of incertitude may arise, if they do not prove more acceptable in their present form.

Although it is asserted that much of the materials required to complete this entire work, so that it may present in a concise and concatenated form the latest improvements of professional skill and ingenuity, are scattered through the printed transactions of Mechanical and Engineering Societies, or are to be found in journals devoted to engineering and mechanical pursuits, this portion of the work bears un-

doubted marks of originality, and in a measure which may fairly entitle it to the attention of those who may be interested in that particular branch of the science of which it treats.

The details and general principles of some designs by English engineers are given with illustrations in this portion of the work, including the Charing-cross and Cannon-street railway bridges, designed by Mr. Hawkshaw.

Reference is, however, as yet omitted to more recent works, which may probably be hereafter given, including the important designs which have received the countenance of Mr. Fowler, Sir Charles Fox, Mr. P. and Mr. W. Barlow, and others. The Chelsea suspension-bridge, as well as the elliptical-arched iron bridge at Westminster, both of which were designed by Page, and to which we have had occasion to refer in these columns, have been fairly instanced.

In other portions of the work, no doubt, further references may be appended in relation to recent discoveries in the structural application of iron.

The Francis Joseph Bridge, lately erected over the river Moldau, in Prague, by an engineer of reputation in this country, and to which allusion has been made in various scientific journals, might be well incorporated with the examples already quoted.

After crossing that structure, and walking a little along the bank or rising slopes at the Carolinenthal side of the river, where a view may be obtained uninterrupted by habitations of any kind, it acquires a singular appearance. From the circumstance of the supporting system of chains being composed of steel, the first application, we believe, of that material in so large a capacity, the superstructure seems exceedingly attenuated. The effect is heightened by the novel arrangement of the main-chains, which are disposed in right lines of deflection from the towers to the roadway, intersecting each other towards the centre of the middle span, and designed to be sustained in that position by a curved chain of smaller dimensions, running above their own direction and throughout their entire extent. To this inferior chain the chains supporting the bridge are attached by vertical connexions, of lengths varying with the interval between the curved and oblique chains.

It is considered that the reciprocal action of the main-chains, from end to end of the structure acquired by this arrangement, possesses advantages over bridges supported by continuous chains, as in the Brunel, Barlow, Page, and other systems. Notwithstanding the apparent lightness of the structure, it is stated to embody in the principle greater rigidity than has yet been attained in any like class of erection. While public attention is attracted to the possible application of iron in the erection of railway and other bridges of far greater span than any which have yet been erected in this country,—say, for instance, over the Severn, Mersey, and below bridge on the Thames,—undertakings any of which may be shortly determined upon, and of which it may be said that all are necessary, inquiry upon the merits of later discoveries in the structural use of iron and steel cannot fail to prove of scientific and public benefit.

In taking leave of the present volumes of the "Dictionary of Engineering," at what, though, from the necessity of the case, an interrupted treatise, may upon its conclusion in the succeeding volume prove one of the more attractive portions of the general work, we can fairly commend it as an undertaking of considerable promise.

It will assuredly fulfil the expectations upon which it was projected, in being useful not only to the experienced engineer, but to all who are in any way interested in the rapid progress which has been made during the past few years in the successful application of the sciences to the arts.

Architect to the Conservative Land Society.—The post of architect and surveyor to the United Land Society (Limited), and to the Conservative Benefit Building Society, which was open to public competition owing to the decease of the late Mr. James Wylson, has been conferred by the two boards of directors on Mr. John Ashdown, formerly surveyor to the Orphan Working School and the Hammersmith Bridge Company, and connected with other public works. There were sixty-one candidates for the position.

KING CHARLES I.'S WATCHES.

SIR,—In reply to the question raised concerning Charles I.'s watches in your number for January 1st, your correspondent and others may be interested in knowing that a watch given by King Charles to a member of the Worsley family, at the period of his removal from Carisbrook to Hurst Castle, is still preserved in that family in the Isle of Wight.

This watch is mentioned by Sir Richard Worsley in his history of the island, and by other writers, and is also described by "Vectis" in the *Illustrated London News* for February 7th, 1852.

Through the kindness of one of the family to whom the watch belongs, I am enabled to add the following extract from the will of the Rev. F. Worsley, who held the livings of Chale and St. Lawrence, in the Isle of Wight, from 1754 to 1808:—

"Chale, January, 21, 1806.

"I give my watch, which was given into our family by the great and good King Charles I., of glorious memory, to my son, the Rev. James Worsley, of Billingham, and do most solemnly and ardently request, desire, and enjoin him to do all in his power to cause it to be preserved in the name of Worsley, his own descendants, &c., to the latest generations.

May the gracious God confirm, prosper, and bless my petition and injunction.—F. WORSLEY."

L. H. B.

"THE HEARTHS IN OUR HOME."

THERE is, unfortunately, too much cause for complaint of the manner in which trimmer-arches are constructed for the support of the hearth-stone. The very best brick trimmer-arch is but a clumsy way for supporting the "slab;" it also adds unnecessary weight to the already weakened trimmer-joist. It was to remove these defects that I lately introduced a trimmer-arch of boiler-plate, screwed to the joist, which has answered the purpose beyond my most sanguine expectation. W. J. G.

STATISTICS OF RAILWAYS.

THE INSTITUTION OF CIVIL ENGINEERS.

AT a recent meeting, Mr. Vignoles, F.R.S., President, in the chair, the paper read was "On the Statistics of Railway Expenditure and Income, and their bearing on future Railway Policy and Management," by Mr. John Thornhill Harrison.

Diagrams were exhibited, giving a synopsis of this information for twenty of the principal railways in England and Scotland, which represented about 85 per cent. of the entire capital expended in the United Kingdom. The most striking feature of this traffic was the large numerical proportion of third-class passengers, and, with few exceptions, they yielded the largest amount of revenue. The circumstances which seemed to affect the number of persons travelling first, second, and third class were considered; and whilst it was admitted that each locality required a separate study, it was thought that there were probably some general principles which, with allowances for variable circumstances, might prove useful guides; and it was deduced that where low fares filled the trains, a moderate difference in them effectually sorted the passengers, and tended to increase the demand for first and second class tickets for long journeys.

On the question of the further extension of railways, it was urged that many lines might be constructed at a cost of from 3,000*l.* to 5,000*l.* per mile, provided the landowners would sell their land for the purpose at the ordinary market value, that the Board of Trade would allow level crossings, and that gradients as steep as 1 in 20 or 1 in 30 were adopted.

Attention was directed to the striking similarity on the different lines of the per centage of expenditure on the gross receipts, which averaged about 48·4 per cent., and the combined expenditure for maintenance, rolling stock, and locomotive power, which generally exceeded 50 per cent. of the total expenditure, the other heavy item being about 30 per cent. for traffic expenses. The total locomotive charges were generally from 8d. to 9d. per train mile. The repairs amounted to about 3¼d. per train mile, when the mineral traffic was heavy, and from 2¼d. to 3d. on the passenger lines south of London. Under the head of running expenses, the item of wages was strikingly similar on all the lines, being about 2¼d. per train mile. The cost of fuel per train mile varied greatly. On the southern lines, where the consumption was small, the cost was 3d. or 4d. per train mile, whilst on the northern lines, where the consumption per train mile was large, but the price was small, it was only about 2d.

The per centage of net revenue on the total capital expended exceeded 5 per cent. per annum on eight lines; was between 4 and 5 per cent. on four; 3½ to 4 on other four; 3 to 3½ on two; and only in two cases was it under 3 per cent. This per centage was influenced by the cost of construction and the character of the traffic, and showed the importance of their consideration. The amount available for dividend was dependent on the per centage on the total capital. When this per centage fell below 4½ per cent. the stockholders' dividend was diminished to supply the deficiency, and *vice versâ*; it depended most on the burdens to be borne; but where lines could *bonâ fide* pay all their engagements, and have a surplus to divide, the elasticity of the railway system seemed to promise at an early date a fair rate of dividend.

Two large funds for investment of capital were next considered: the national debt, which amounted to 750 millions sterling, and gave a return of 26½ millions per annum, or 3½ per cent., which was a burden on the industry and capital of the country; and the capital expended on railways, which amounted to 500 millions sterling, giving a return of 20 millions, or 4 per cent., per annum; whilst a sum nearly equal to the interest on the national debt was annually expended in labour and materials.

It appeared that 54 per cent. of the railway capital had been expended since 1849, in which year it amounted to 228,747,779*l.*; whereas in 1867 it was 502,262,887*l.* The length of railways in operation had been more than doubled, being 6,032 miles in 1849, and 14,247 in 1867. The length of double line was increased from 5,034 to 7,844 miles, or 56 per cent.; whilst the single lines had been increased 542 per cent., or from 998 miles in 1849 to 6,403 miles in 1867. Notwithstanding this, the cost per mile was maintained at from 33,000*l.* to 36,000*l.* per mile. This was explained by the general traffic having increased 240 per cent., and the goods traffic 400 per cent.; whilst the capital expenditure was only 120 per cent. This augmented traffic demanded extensive increase of rolling-stock, sidings, and station accommodation, especially for goods. The traffic was still largely on the increase, and this would necessarily delay the closing of the capital accounts, which was desirable.

The burdens on railway property, as they affected the original shareholder, and the proposals for relieving these burdens to some extent, were next considered. One of these proposals was, that Government should take upon itself the responsibility of the loan capital at an equitable price; and it was argued, that as they could borrow money at a low rate of interest, they might benefit the railway companies and the public by an arrangement for gradually extinguishing the loans and reducing the fares and rates.

RUSSIAN MEMORIAL CHURCH AT SEBASTOPOL.

LETTERS from Sebastopol say that the Church of St. Nicholas, erected in memory of the Russian soldiers who fell in the Crimea, and dedicated to St. Nicholas the Wonder Worker, will be consecrated in May. The foundation stone was laid in 1856, close to the cemetery known as "The Cemetery of the Hundred Thousand," and the Church of St. Nicholas, already completed as a building, will, when it has been fully decorated, be the most magnificent religious edifice in the South of Russia. The contributions to the building fund from all parts of Russia have been immense, the largest offerings being those of the Princess Vassiltchikoff, widow of the late President of the Council of the Empire, who is an annual subscriber to the amount of 15,000 rubles. The church is paved with granite taken from the ruins of Sebastopol docks. The walls are, for the most part, of grey marble from the Crimean quarries. The cross and windows are formed of a Crimean stone called atonite, while for other portions of the interior green, black, and fawn-coloured diorite is employed. Above the entrance is the face of our Saviour in mosaic, and sunk into the outer walls of the church are large slabs of marble bearing the names of all the officers who fell in the war. The left wall is dedicated to officers of marine artillery, of cavalry, and of infantry;

the right wall to officers of engineers, of the staff, of the navy, and of cavalry and infantry. Connected with the church is a memorial chapel, containing portraits of about two hundred of the principal actors in the war, including the Emperor Nicholas, the Emperor Alexander II., and the Grand Dukes Constantine and Michael. "Pilgrimages," says the *Gazette of New Russia*, "will be made to the Church of St. Nicholas from all parts of the empire, and there will be an enormous gathering to witness the consecration of the building; for who did not lose a relation in the Crimean war, and who will not wish to visit the grave of his father or his brother?" It would seem, then, that the memory of the Crimean war is cherished by the vanquished.

HARROGATE.

SIR,—With regard to the progress of Harrogate mentioned in the *Builder* of Saturday, the 19th, and especially with regard to the competition plans of the Public Rooms Company, I have, on behalf of Messrs. Shutt & Thompson, and myself, to say that, although the directors knew we were waiting outside to explain our plans, we were never invited to do so. I enclose you two paragraphs from Harrogate papers, showing that this circumstance is being canvassed.

RICHARD DYSON.

WAGES IN MANCHESTER.

A JOINER'S CLAIM FOR WAGES.

A CASE that interested the joiners and carpenters of Manchester was decided by Mr. Headlam at the city police-court. John Johnson, builder, was summoned by a workman, named Edward Bennion, for the sum of 5s. 11d. as wages due.

Mr. Bent, in opening the case for the complainant, said that during the previous summer there was a considerable dispute in the building trade, with reference to the wages paid the workmen; but it was finally settled by Mr. Kettle as arbitrator. It was then decided by certain of the masters on behalf of the building trade, and certain parties on behalf of the workmen, that 7½d. per hour should be paid from May, 1869, to May, 1870. That, of course, became a rule of the trade, and when a man was engaged it was understood he was hired on these terms except the contrary was stated. In this case the complainant, with twenty others, were engaged by Mr. Johnson on the 24th of January last, but no mention was made of wages. At the expiration of the first week's work, the complainant only received 30s. 4d. instead of 33s. 7d., and said to the cashier it was not at the rate of 7½d. per hour, whereupon the cashier replied, "Oh, it is all right; we shall make it right next week." On the following Saturday the complainant again only received the 30s. 4d., which he took under protest, and he and fourteen others then left Mr. Johnson's employ.

For the defence it was contended that the complainant did not possess the "average skill"—a provision of the rule laid down by the arbitrator, and therefore was not entitled to the full wages of skilled artisans.

After hearing some further evidence, Mr. Headlam gave an order for one half the amount claimed.

HOUSE AGENTS' RESPONSIBILITIES.

STINTON *v.* CURTIS.

THIS was an action (Court of Exchequer, February 19th, Second Court, before Baron Martin) brought by a widow lady against a house agent for alleged negligence in letting her house to a person who was unable to pay the rent. The defendant pleaded several pleas, which in substance denied that he had been guilty of any negligence.

Mr. Oppenheim appeared for the plaintiff, and Mr. M'Intyre for the defendant.

It appeared that the plaintiff is a widow lady residing at 3, Langham-street, Langham-place, and the defendant a house agent, carrying on business at Langham-place. In May, 1868, the plaintiff employed Mr. Howe, the then partner of the defendant, but who has since died, to let her house for some months, on the condition that the first two months' rent, amounting to 35*l.*, was to be paid in advance before the tenant was to be allowed to take possession. According to the plaintiff's case, the defendant negligently allowed a person to take possession of the plaintiff's house without paying the rent, which she had since been unable to recover. She now brought this action to recover the 35*l.* she had so lost, as well as certain expenses to which she had been put in the matter.

The defence was, that the person in question had improperly obtained possession of the plaintiff's house, and that therefore the defendant was not responsible.

The jury returned a verdict for the plaintiff,—Damages, 30*l.*

RESISTANCE TO FIRE.

SIR,—As a means of preventing the destructive ravages of fire, especially desirable in offices, libraries, art repositories, picture galleries, and other premises, I beg to advise that the plating of roofs with sheet-iron plates, be adopted, as fires thereby would almost certainly be confined to the apartment they originate in, by reason of the obstacles to the progress of fire by the sheet-iron roofing. The plates could also be laid as shutters for libraries, and in picture galleries, and be made to fold or slide away, from place to place, as required. The complete adoption of iron plates being laid for the protection of roofs of domestic house lower apartments, would probably result in the saving of valuable lives and properties, and reduce insurance fees, to such an extent as to pay interest for the extra cost in building houses, offices, and warehouses, guarded with sheet-iron plates. The surface of the plates would allow plastering, painting, and paperhanging to be used as now, and if necessary punctures through the plates into the woodwork they are fastened to, could be made for any purpose. As a desirable measure for adoption, I beg to ask your consideration hereof.

For ships and steam-vessels, the light extra expense of the iron-plating, should be worth notice to adopt it, to prevent calamities: a little time gained by opposing the fire may end in saving life through aid arriving.

PROGRESS.

*** Similar propositions have been made and carried out again and again,—slates, extra thick plastering put at the upper and underside of the laths, &c. We print the letter simply as reminder, and to keep under attention the desirability of improved construction in the direction of incombustibily.

THE PIPE-LAYING CAT.

THE pretty tale is well known of a prisoner who made a spider's web serve to draw up a fine thread, the thread a string, and the string a rope strong enough for him to escape by. We have just now heard a little story of a cute young Yankee in Lisbon, Ct., which may go with this. He wanted to lay a water-pipe through a drain several feet below the surface without digging up the drain; so what did he but tie a string to a cat's leg, thrust her into one end of the drain, and gave a terrific "S'cat!" The feline creature, thus made a cat's-paw, and dreading a catastrophe or cataclysm, quickly rushed through the other end, as if from a catapult or cataract. The pipe was drawn through by means of the string, and 10 dollars were saved by the transaction;—a categorical result entitling this cat of the catacomb to be included in the next catalogue of labour-saving machines.

Books Received.

Our Domestic Fireplaces: a New Edition. By FREDERICK EDWARDS, Jun. London: Longmans, Green, & Co. 1870.

THIS is a much improved and enlarged edition of a work already noticed by us in past years. It has been entirely rewritten, the additions completing the author's contributions on the domestic use of fuel, and on ventilation.

In his first chapter the author gives an interesting sketch from various sources, of much relating to the history of the fireplace. In the second he details the progress made in this country during the present century. In the third, he enters into the details of various improvements which are possible at the present time, or may become practicable in the future. In the fourth he takes up the subject of stoves and other means for effectually warming the halls and other portions of dwellings, which are now in a great measure disregarded by builders, whom some ignorant critics, we may here observe, in charging them with ignorance or stupidity, speak of as "the lower classes of architects;" whereas architects of any class have too often nothing to do with the construction or arrangement of "our domestic fireplaces."

The volume is illustrated by numerous plates of grates, stoves, and other fireplaces, hot-water apparatus, &c. A portrait of Count Rumford forms the frontispiece.

The author thus states his views of what could be accomplished by hot-water circulation:—

"At one end of a line of houses boilers and furnaces could be fixed, and from the boilers hot-water circulating pipes, protected to prevent loss of heat, could pass in proximity to the houses. From such main circulating pipes, branch pipes, also protected, could enter each house, and ascend to any height required, with branches for drawing off water for baths and other purposes, and with other branches which would admit the water to circulate, when required, through hot-water coils for warming the house. That there would be any insuperable difficulty does not appear for a moment. The extent to which hot-water circulation has already been applied is a sufficient proof of its possibility. Competent persons could be as readily found to manage such a system as to make gas or to drive a railway train. The contingencies of a temporary failure of supply would be simply met by every house having the means of falling back upon something provided, just as we can substitute candles for gas. And, with respect to economy and efficiency, it is not possible to conceive how any system could be more economical, due care being taken in all matters of detail, or more efficient, inasmuch as the constant attention of a skilled person should adapt the system, to some extent, to the demands of the thermometer. Irrespective of this, there would be ample facilities of regulation left in the hands of the occupier."

Marvels of Architecture, translated from the French of M. Lefèbre. To which is added a Chapter on English Architecture. By R. DONALD. London: Cassell, Petter, & Galpin.

THIS is a pretty little book, very readable, and likely to interest many in what architecture has done. It is not intended for the professional student. The chapter on English Architecture is the least satisfactory part of the volume, and further confirms what we recently said as to its being desirable that persons who write about buildings should know something of architecture. Take an instance in proof. The author is speaking of "the Gothic style of architecture which sprang into ascendency during the Middle Ages," and says,—

"The style is also widely known as the *Pointed* style of architecture, and is very largely to be found in the *Saxon and Norman* edifices of this country. What is known as the *Corinthian order* of Pointed architecture is, indeed, almost peculiar to England."

Very peculiar indeed, we should say. Again,—

"Though the Gothic and Pointed styles are often confounded, there is considerable distinction between them. In Gothic, the general running lines are horizontal, as in entablatures and single cornices; in Pointed, the general running lines are vertical."

The author is evidently at sea. Nevertheless, it is an interesting little book: and it includes a considerable number of illustrative woodcuts.

VARIORUM.

"A GUIDE to the Churches of London and its Suburbs, for 1870." By Charles Mackeson. Parker, Strand. In this fifth issue of a very useful guide some improvements have been effected, as in the consecutive numbering of the alphabetical list of churches, so increasing the utility of the index. Another little improvement we would suggest. Although the guide is an alphabetical one, there is no alphabetical entry whatever of St. Paul's Cathedral, of Westminster Abbey, nor of the Royal Chapels, under any heading. This is certainly a defect. The reason of it is, that these churches and chapels are all placed at the head of the alphabetical list, which latter begins with "9. Alban, S., Holborn," without even a short rule to separate it from the last of the royal list, which is, "8. Chapel within Hampton Court Palace." Let the preferential list remain, by all means; but why not insert references to it in the proper alphabetical order?

Miscellanea.

Destruction of St. John's Church, Bethnal-green.—A fire has destroyed the district church of St. John, situated at the south-western corner of Bethnal-green. It was a capacious edifice, with sittings capable of affording accommodation for over 2,000 people. Workmen had been employed for some time in enlarging the illuminated clock in the steeple, and it is supposed that the fire arose through carelessness on their part; for, about seven o'clock p.m., a glare of light was visible in the steeple, and in a short time the flames burst forth through the clock-turret. Some seven or eight steam fire-engines soon arrived, but unfortunately no supply of water could be obtained for a considerable time. The firemen conveyed the hose into the interior of the church, but their efforts were frustrated from the cause referred to. The flames soon spread to the roof, and by half-past eight the whole of the building was in flames. It was not until that time that the engines could get a supply of water. Portions of the roof had fallen in, and set fire to the pews, in the galleries as well as in the body of the church. The fire continued to rage till ten o'clock, by which time the church was almost entirely destroyed. The parish church of Bethnal-green, in Church-street, was burnt down only a few years since.

Geographical Medal and Award to M. Lesseps.—At the general meeting of the French Geographical Society just held, M. Barbié du Bocage, reporter of the committee to award the Empress's Grand Prize of 10,000 francs, given this year for the first time, announced that the award of that body had been in favour of M. Ferdinand de Lesseps, who, by cutting through the Isthmus of Suez, had accomplished the work most useful to the commercial relations of France. M. de Lesseps received from the president the medal which accompanies the prize, and announced that he would devote the sum of money to the expedition which the society is about to undertake into Central Africa.

The Drainage of Margate.—The articles that have from time to time appeared in our columns on the cesspool system at this very favourite watering-place, have had effect, we learn, on some of the freeholders of the town, if not upon the local Board of Health, and an extensive system of tubular earthenware pipes is now being laid throughout the whole of the large block of houses known as the Royal Crescent Estate. The works are being carried out by Messrs. Docwra & Son, of Islington, from plans prepared by Mr. W. Lane Sear, of Margate, architect.

Accidents.—A destructive fire has occurred in Newcastle, Atkinson's saw-mills having been burned to the ground, and 8,000*l.* worth of property thereby destroyed. There was a strong wind blowing, and no water was obtainable for a considerable time. This is the second saw-mill burned down in Newcastle within a month.——At midnight, on Friday week, the inhabitants of the Boulevard Jourdan, at Marseilles, were aroused by the noise of a terrific crash, which was discovered to have been caused by the falling in of two contiguous houses. After an hour and a half's work, eight men, all still living, but very seriously injured, were extricated, and exertions were being made to discover a young man and woman, who were known still to be beneath the *débris*.——The *North German Correspondence* reports that at about two o'clock in the morning recently, a rather alarming fire broke out in the upper part of the Palace of the Prussian Crown Prince, just above the apartments of the Princess Charlotte, the ceilings of which were partially consumed by the flames. The young Princess having been removed to another portion of the building, the fire was soon extinguished by the exertions of the fire brigade. The fire is believed to have been caused by a coal or spark from a chafing-dish with which some workmen, the day before, had been trying to thaw the frozen water-pipes.

House of Commons.—In answer to Mr. Locke King, Mr. Ayrton said that, owing to arrangements between the Government and the Metropolitan Railway, the subway projected some years ago from Parliament-street to Palace-yard could not be completed as originally proposed. He had, however, been in communication with the Metropolitan Board, and he had urged upon them the propriety of connecting the subway with the Embankment.—— Mr. Cowper-Temple asked whether the Government are prepared to take measures for relieving the overcrowded condition of the objects placed for exhibition in the British Museum by means of the erection of a new building for the collections of natural history. Mr. Ayrton, in reply, said the Government had the subject still under consideration.——Mr. Samuda also has given notice to ask whether, before the Government approve of the site that may be selected by the Corporation for the waterside market for foreign animals, means will be taken to ascertain the views of those interested in the trade, and to insure a sufficient extent of accommodation being provided.

A Caution.—It ought to be pretty well known by this time that the copyright of Mr. Maclise's grand pictures, "Wellington" and "Nelson," in the Royal Gallery, at the Houses of Parliament, was purchased by the Art-Union of London, and that engravings are in course of active preparation for distribution. It takes a long time, however, to make such facts known, even in circles supposed to be well informed on such points. Thus Messrs. Ward & Lock had reproduced for publication, as a chromolithograph, the centre portion of the Wellington picture, and were about to publish it. On receiving notice, however, from the Hon. Solicitor of the Art-Union that the society would maintain its rights, those gentlemen at once expressed regret for having unwittingly done wrong, and forwarded all the impressions, some 3,500 in number, to be destroyed. Great credit is due to Messrs. Ward & Lock for their prompt acknowledgment of error. We mention the occurrence simply as a caution to other publishers.

The Railway for Japan.—A contract for the construction of a railway has been concluded by Mr. H. N. Lay, C.B. He represents capitalists who have entrusted him with money to be lent to the Japanese Government for the construction of reproductive public works, and he advances one million sterling to the Japanese Government for a line from Yedo to Osaka, some 300 miles, to be built by English engineers. The railway will be the property of the Government.

Ramsgate.—The New Cemetery.—The contracts for building the chapels, lodge, walls, &c., have been received by the board, and Mr. Wilson, builder, of Canterbury, is the accepted contractor for the erection of the chapels, for the sum of 1,882*l.* Mr. Duckett's tender for the lodge and wall, at a sum of 2,400*l.*, was accepted; but a letter was read from Mr. Duckett, to which the clerk was instructed to reply, and inform him that the board was not prepared to entertain the proposals contained therein.

The Alexandra Palace.—At Crouch-end Mr. Francis Fuller lately gave an address on the advantages and capabilities of the Alexandra Park and Palace, to a crowded meeting, desirous to hear what was to be done with the Palace. Mr. Fuller, according to the report in the *North Londoner*, said:—

"The British Museum was established by lottery, and he meant to have the Alexandra Palace established in a similar manner by the Art-Union system. He would not have it an exhibition of painting and sculpture solely, but of every article of use and ornament, that it might serve as an encouragement to trade as well as for instruction. The value of the palace and grounds was 650,000*l.*, which he proposed to deal with on the Art-Union and Tontine systems combined. He would collect in the palace 100,000*l.* worth of prizes, and have a distribution every three years. Mr. Webster, Q.C., proposed that a committee be formed in the locality to assist Mr. Fuller in his object, which was unanimously agreed to. In reply to a question, Mr. Fuller said he was working in union with the owners of the property, and they had fixed the price at which they were ready to dispose of it."

Mr. Fuller commended his project to the consideration of the residents.

The Water Supply of the City.—At a meeting of the Court of Common Council, to be held this day (Thursday), a motion is to be proposed by Mr. Deputy Stapleton, to the effect that having regard to the report of the Royal Commission, the question of the supply of water to the inhabitants of the City be referred to a committee, for them to inquire and report forthwith to the court as to whether it will be to the advantage of the public that the interests of the existing water companies should be purchased, and that the subsequent management should be vested in the corporation. At the same court Mr. Cockerell will bring up a report from the coal, corn, and finance committee, recommending that the sum of 1,200*l.* be expended in erecting a drinking-fountain in Smithfield, and that the corporation undertake to expend the sum of 50*l.* annually to supply it with water.

Finsbury Park.—Mr. Vulliamy, superintending architect to the Metropolitan Board of Works, estimates the expenses of this park during the year 1870 to be as follows:—General superintendent, 50*l.*; park superintendent, 104*l.*; gardeners, twelve, at 21*s.* each per week, 655*l.* 4*s.*; hire of horses for rolling and mowing machines, average 2*l.* 14*s.* per week, for twenty-six weeks, 70*l.* 4*s.*; repairs to machinery, lodge, &c., 25*l.*; repairs to fences, roads, walks, and gates, 100*l.*; manure, 100*l.*; trees, shrubs, grass-seeds, and lake, 100*l.*; water, at 7¼*d.* per 1,000 gallons (800,000 gallons), 25*l.*; gas, 4*l.*; land-tax, 2*l.* 11*s.* 4*d.*; poor-rates, 50*l.*; tithes, 1*l.* 18*s.* 4*d.*: total, 1,287*l.* 17*s.* 8*d.*

The Holborn Board of Guardians.—At a recent meeting a letter, dated the 3rd inst., was read from Mr. F. Peck, architect, inclosing a communication which had been addressed to him by Messrs. Batstone & Hunt, as follows:—"Finsbury Schools. Dear sir: In May last we sent you a statement of our charges, amounting to 284*l.*, for preparing the quantities of the district schools, &c. Hoping you will soon obtain a cheque for us, we are, &c." Mr. Peck, the architect, also claimed 630*l.*, in regard to preparation of plans, and 3 per cent. upon work undone, for which, if carried out, he would have received the usual commission of 5 per cent. Consideration of the matter was deferred.

Manchester Ship Navigation.—Considerable interest has been excited, it is stated, respecting this subject, and it appears that the conclusion at which practical men who have fairly considered the matter have arrived is, that the proposed plan is quite practicable; and that Manchester and other capitalists are prepared, if the Mersey and Irwell Navigation proprietors are willing to give their earnest co-operation, to contribute funds in order to advance the undertaking. A survey is proceeding, it is said, under the direction of Mr. Fulton, engineer, and upon the result of his investigation will much depend the progress of the undertaking.

The Education Bill.—The Elementary Education Bill, introduced by Mr. Forster and Mr. Bruce, has been printed. It fills twenty-six pages, and contains eighty-eight clauses. It is divided into two parts; the first, which extends to the 81st clause, relates to "Local provision for schools," and the second to the "Parliamentary grant." There are four schedules attached to the Bill, one of which lays down rules respecting the election of school boards, and another directions for the conduct of its proceedings.

The Cambridge Slade Professor.—The Slade Professor of Fine Arts in the University of Cambridge (Sir Digby Wyatt) proposes to deliver a course of thirteen lectures, as follows:—1, Introductory, March 9th; 2, Architecture, History, March 14th; 3, ditto, Theory, March 15th; 4, ditto, Practice, March 16th; 5, Sculpture, History, March 28th; 6, ditto, Theory, March 29th; 7, ditto, Practice, March 30th; 8, Painting, History, May 2nd; 9, ditto, Theory, May 3rd; 10, ditto, Practice, May 4th; 11, Art applied to Industry, Ancient, May 20th; 12, ditto, Modern, May 21st; 13, Facilities at Cambridge for the Study of the Fine Arts, May 23rd. The lectures will be delivered in the Fitzwilliam Museum at 2.15 p.m., with the exception of the introductory lecture, which will be delivered in the Senate-house at 2.30 p.m.

London House Painters' Association.—The society that was formed, as we have before mentioned, some months ago, under the title of the London House Painters' and Decorators' Technical Instruction Association, and having its head-quarters at the London Artisans' Club, 73, Newman-street, continues its classes at the Marylebone School of Art, in Bolsover-street; and, considering the very depressed state of the building trades, the association has been fairly supported. On Wednesday evening in last week the members adjourned to the large hall of the German Club, in Foley-street, to hear a lecture by Mr. John G. Crace, "On Art Training," Mr. Edward Hall in the chair. At the conclusion the meeting was addressed by Mr. Lamport, Mr. Shipton (the secretary), and others.

The Restoration of Chester Cathedral. A meeting has been held in Liverpool for the promotion of the further restoration of Chester Cathedral. Of the 55,500*l.* stated by Mr. Scott to be requisite for the complete restoration, the Dean stated that works to the extent of 31,500*l.* had been secured by subscriptions and expended on works, with the exception of 7,000*l.*, now in the bank. The roofs and the interior groining of the nave were now under consideration. A special additional fund of 5,000*l.* for the groining, &c., while the scaffoldings were up, was now requisite. The whole work could not be completed within three years. The meeting was intended as a preliminary to one appealing to Lancashire in particular for aid.

The International Safes Contest.—Trade jealousies still keep up the excitement on this subject. The two American arbitrators and the French one having decided the contest in favour of Herring, the American, without the two English arbitrators, who had resigned in consequence of what they considered not very honourable conduct on the part of the Americans, an action in the Tribunal of First Instance, was commenced by Herring against Chatwood, the English lockmaker, and Tagnard, the stakeholder, and after three days' trial, has terminated by a judgment declaring the so-called award null and void, and condemning Herring in the costs.

St. Mary's Church, Torquay, South Devon.—A vestry meeting was held in this parish on the 16th inst., to consider the proposal to complete the church by building the tower in accordance with the plans prepared by Mr. Hugall, of Oxford, under whose direction the church has thus far been erected,—the first portion, the chancel and chancel aisles, by the late Mr. Thos. Darby, of Cheltenham; and the nave, north and south aisles, and porch, by Messrs. Wall & Hook, of Brimscombe. It was decided that it is desirable to complete the church at a cost of 2,700*l.*, and a committee was appointed to collect funds.

Easter Island.—At a meeting of the Society of Antiquaries of Scotland, held on Monday week, Lieut. M. Dundas read a communication on "Easter Island: its Inhabitants, Antiquities, and Colossal Statues." In the course of conversation with reference to Lieutenant Dundas's paper, Dr. Smith mentioned that a previous visitor of the island had found old graves almost exactly identical with those found in the Hebrides and in Shetland.

Value of Land, Derby.—The local papers say that the piece of land at the corner of St. James's-street, fronting the Corn Market, has been sold by the Derby Improvement and St. James's Hotel Company, to Mr. Randall, at 30*l.* a yard, subject to the approval of the directors who did not take part in the negotiation.

Bristol Corn Exchange.—Correspondents from Bristol say that Mr. E. M. Barry, who was consulted with reference to the proposed covering of the quadrangle of the Exchange, has sent a report, accompanied with two plans, which were presented to the committee at their last meeting. The first plan would cost about 2,700*l.*; but that he did not recommend to be adopted, nor did the committee think it would be acceptable. By the second plan, the present pillars supporting the arcade are to be removed and replaced by more ponderous ones, of the Doric style of architecture, set farther back. Above these the existing pillars will be erected so as to form a second row, advancing more towards the centre of the Exchange, and supporting an illuminated cupola. The cost of the latter plan would be about 4,000*l.*

Norfolk and Norwich Archæological Society.—The annual meeting of this society has been held at the Guildhall, Norwich. Upon the table were a number of interesting objects, and there were also presented for the inspection of the members some panels from the Loddon Church screen, alluded to in a paper by Mr. L'Estrange. The hon. secretary, Mr. C. R. Manning, read the report; after which, office-bearers were elected or re-elected. The Rev. C. R. Manning then read a paper contributed by Mr. H. Harrod, "About Norwich Thieves in the Thirteenth Century;" and Mr. Fitch one from Mr. L'Estrange on Loddon Church.

Dockyard Men.—We understand that great consternation was occasioned (and no wonder) on Monday morning, at the Devonport Dockyard, by orders from the Admiralty expediting the discharge of workmen, and that forty-one were sent away on Saturday last, without a day's notice, before the arrival of their pension papers.

Effects of Criticism.—It has been currently stated, that of the two architects who were concerned in the erection of the recently-completed opera-house in Vienna, and which was somewhat severely criticised, one jumped into the Danube, and the other hanged himself. We should be glad to have the correctness or otherwise of this story certified.

Cottage Gardens and Window Gardening.—Forty essays have been sent to the Horticultural Society in competition for the prizes offered by Mr. W. Egerton Hubbard, jun., for the best essays on the management of cottage gardens and window gardening. It is intended to have the best essay printed in the plainest possible form and circulated among the various cottage gardens in the country.

Polytechnic Institution.—We are glad to see that the terrible rubbish which was called "The Mysteries of Udolpho," has been given up. Some very agreeable entertainments have been substituted.

Surveyor for Leamington.—Mr. Davidson, a surveyor, late in the service of the Manchester Corporation, has been elected surveyor to the Leamington Local Board of Health.

The Literary Fund.—Lord Dufferin will preside at the next annual dinner of this corporation, which is fixed to take place, on Wednesday, the 11th of May, at Willis's Rooms.

A Memorial Cottage Hospital.—It is proposed to erect a cottage hospital at Shaftesbury as a memorial of the late Marquis of Westminster.

Royal Society.—General Sabine will hold his first *conversazione* of the present season at Burlington House, on Saturday, March 5th.

Portraits.—The portrait we give in our present number, was drawn from a photograph, by Mr. John Watkins, of Parliament-street.

TENDERS.

For alterations and additions to Hailsham Union. Mr. C. Berry, architect:—

Coleman	£2,500 0 0
Stonstreet	2,373 1 2
Avis & Roe	2,270 0 0
Pitcher	2,038 0 0
Funker	2,000 0 0
Harman	1,985 0 0
Peerless	1,941 0 0
Thompson	1,935 0 0
Card & Son	1,930 0 0
Fuller & Co.	1,926 0 0
Skinner	1,885 0 0
Piper & Co.	1,881 0 0
Mosling & Sons	1,850 0 0
Blackmore	1,735 0 0

For new Grammar School, Reading, Berks. Mr. Alfred Waterhouse, architect:—

Cleasy	£24,906 0 0
Gregory	24,878 0 0
Doverwood & Co.	23,798 0 0
Woodrough	23,768 0 0
Brass	23,495 0 0
Matthews	23,212 0 0
Hibbard	22,950 0 0
Pollard	22,384 0 0
Wheeler	22,202 0 0
Bays & Rammage	21,600 0 0
Stains & Son	21,376 0 0
Cowland	21,840 0 0
Simpson	21,765 0 0
Colls & Son	21,746 0 0
Jackson & Shaw	21,741 0 0
Mansfield & Price	21,555 0 0
Macey	21,384 0 0
Gibson, Bros.	21,178 0 0
Horseman	21,486 0 0
Walton, Bros.	21,427 0 0
Perry & Co.	20,915 0 0
Woodbridge	20,730 0 0
Blackmore	20,574 0 0
Holland & Hannen	20,484 0 0
Jones	19,950 0 0
Kirk & Parry	19,905 0 0
Wright & Co.	19,895 0 0
Dimment	19,385 0 0
Bull & Son	18,900 0 0
Parnell & Son	18,707 7 7
Clarke	17,831 0 0

For re-roofing twelve cottages at Wonford, near Heavitree, Devon, for Mr. J. Scudder. Mr. Charles Pinn, architect. Quantities supplied:—

Gardiner	£270 0 0
Easton	226 0 0
Harris	220 0 0
Smith	210 0 0
Westlake	209 0 0
Stephens	205 0 0
Scadding (accepted)	201 0 0

For Archbishop Tenison's new schools, about to be built in Leicester-square, on the site of the old Sablonière Hotel. Mr. F. Marrable, architect. Quantities by Mr. W. F. Meakin:—

Nixon & Son	£4,616 0 0
Clemence	4,481 0 0
Longmire & Burge	4,424 0 0
Mansfield & Price	4,405 0 0
Howard	4,379 0 0
Dove, Brothers (accepted)	4,375 0 0

For the St. Martin's Parochial School for girls, to be erected in Castle-street, Leicester-square. Mr. F. Marrable, architect. Quantities by Mr. W. F. Meakin:—

Nixon & Son	£3,440 0 0
Longmire & Burge	3,319 0 0
Mansfield & Price	3,280 0 0
Clemence	3,274 0 0
Howard	3,187 0 0
Dove, Bros. (accepted)	3,175 0 0

For various alterations, &c., to premises, 24, Crutched Friars. Mr. R. C. Harrison, architect:—

Colls & Sons	£2,283 0 0
Browne & Robinson	1,995 0 0
King & Sons	1,959 0 0

For alterations and additions to The Poplars, West Bromwich, for Mr. T. B. Salter. Messrs. Nichols & Chamberlain, architects:—

Fisher	£449 0 0
Wilkes (accepted)	443 10 0

For the erection of infants' and girls' school, with mistresses' residence, Walsall, for the committee of St. Peter's parish. Messrs. Nichols & Chamberlain, architects:—

Briley	£1,625 0 0
Wilkes	1,540 0 0
Jeffrey & Pritchard	1,482 0 0
Trow & Sons	1,473 0 0
Hitchin, Bros.	1,450 0 0
Nelson	1,440 0 0
Fisher	1,391 0 0
Thompson	1,370 0 0
Taylor	1,349 0 0
Stockton & Son	1,343 0 0
Rowley	1,300 0 0
Adkins*	1,274 10 0
Holland, Bros.	1,270 0 0

* Reduced estimate accepted, £1,193 15*s.*

For alterations and additions to The Cedars, Winchmore-hill. Mr. J. W. Dobson, architect:—

Cheffin	£1,028 0 0
Wood, Bros.	995 0 0
Rivett	953 0 0
Read & Son	825 0 0
Wicks & Bangs	785 0 0
Ward	704 0 0
Ensor	748 0 0
Patman, Bros.	735 0 0

For erecting the chancel, nave, and aisles of St. Stephen's Church, Villa-street, Walworth. Messrs. H. Jarvis & Son, architects:—

Downs	£6,546 0 0
Marsland & Son	6,400 0 0
Thompson	6,327 0 0
Henshaw	6,082 0 0
Merritt & Ashby	6,000 0 0
Higgs	5,983 0 0
Carter	5,870 0 0
Bartlett	5,845 0 0
Longmire & Burge	5,804 0 0
Colls & Sons	5,784 0 0
Dove, Bros.	5,640 0 0
Myers & Son	5,419 0 0
Tarrant	5,186 0 0

For new rectory-house at Cotehill, near Westherall, Cumberland, for the Rev. John Howard. Messrs. E. Habershon & Brock, architects:—

Court (accepted)	£1,417 0 0

For a small conservatory at The Cedars, Basingstoke, for Mr. R. A. Davis (exclusive of heating):—

Norman & Co.	£190 0 0
Cumming & Edmunds	176 0 0
Preedy & Son	160 10 0
Glover	159 0 0
Lewis	159 0 0
Lammie & Co.	158 0 0
Jennings	155 0 0
Duke	155 0 0
Palmer	153 1 6
Woodbridge	153 0 0
Stevens	148 0 0
Wilks	145 5 6
Simmonds (too late)	144 0 0
Pistell (accepted)	126 0 0

For alterations and additions to Ripley House, Ripley, Surrey. Mr. James K. Colling, architect:—

Hills	£1,875 0 0
J. & A. Wright	1,575 0 0
Spicer	1,574 10 0
Jarrett	1,487 0 0
Harris	1,475 10 0
G. & J. Wood	1,470 0 0
Farley	1,305 0 0
Saunders & Beevers	1,300 0 0
Todd & Sanders	1,225 0 0
Lammie & Co.	1,168 0 0

TO CORRESPONDENTS.

J. R. O. (cancelled). We do not desire to print letters sent to half a dozen papers).—A Shoemaker not Shod (not clear. State a case to illustrate).—Architectus (observation must have been a mere excuse). —Dr. G.—C. R. V.—G. B. M.—W. W. L.—Dr. T.—F. M.—F. P. W.—R. J.—C. & Co.—T. M.—River Commission.—C. & Sons.—H. P. H.—W. R. W.—J. B. C.—S.—G. M.—A. Z.—E. I.—J. H.—A. H.—Mr. G.—C. C. H.—J. C.—F. M.—J. R.—S. & J.—A. H.—A. T.—T. P.—Messrs. H.—N. & C.—G. P. M.—W. & H.—A. G.—R. D.—W. H.—T. H. A.—C. —J. W. T.—G. G.

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of Tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

IMPROVED MACHINERY, combined with **STEAM POWER,** is employed by J. W. BENSON in the Manufacture of Church, Turret, Stable, and Tell-tale Clocks, Sun and Wind Dials, Perpetual Calendars, and every description of Clock and Watch Work. Architects, Builders, Committees, &c. can be promptly supplied with estimates. A descriptive Pamphlet on Church and other Clocks, post-free, 2d. J. W. BENSON, by special appointment, Watch and Clock Maker to His Royal Highness the Prince of Wales. Steam Factory for Clocks and Watches, 58 and 60, Ludgate-hill; Showrooms, 25, Old Bond-street, London.

ADVERTISEMENTS.

Just published, Royal 4to. Ornamental Cloth, 1*l.* 16*s.*

ENGLISH COUNTRY HOUSES. Forty-five Views and Plans of recently erected Mansions, Private Residences, Parsonage-Houses, Farm-Houses, Lodges, and Cottages with a Practical Treatise on House Building.
By WILLIAM WILKINSON, Architect, Oxford.
Oxford and London: JAMES PARKER & CO.

Just published, price 4*s.*; post free, 4*s.* 4*d.*

ATCHLEY'S BUILDERS' PRICE BOOK
FOR 1870.
Containing a Complete List of the Present Prices of Builders' Materials and Labour, and of all Trades in connexion with Building; Useful and Important Tables and Memoranda for Preparing Estimates, especially arranged for the use of Architects, Builders, Contractors, and Engineers, &c. compiled by Experienced Men.
To which is added
BUILDERS' PRICES for LEEDS and the WEST RIDING of YORKSHIRE, specially prepared; Tables for Calculating Wages; Builders' Measurements with Bills of Quantities; Marks and Qualities of Timber, and Rules for Calculating the Various Standards; on Iron as Applied to Building Structures, by a "Civil Engineer"; Metropolitan Building Act; List of Members, District Officers, and the Regulations of the Board of Works.
"In conclusion we cannot too strongly commend Messrs. Atchley's Price Book to those who would possess an accurate, complete, and concise work on this subject, and one which bears ample internal evidence that the labours of experienced men have been unsparingly bestowed upon it."—*Mechanics' Magazine*, January 29, 1870.
ATCHLEY & CO.
Architectural, Engineering, and Fine Art Publishers,
LONDON: 106, GREAT RUSSELL STREET, BEDFORD SQUARE, W.C.
And all Booksellers own or Country

"WORKING PEOPLE and IMPROVED HOMES."
The new and illustrated edition of "The Dwellings of the Labouring Classes," by HENRY ROBERTS, Esq. F.S.A. (author of "Home Reform," and "The Physical Condition of the Labouring Classes") will be found a summary of the efforts at home and abroad to secure "Healthy Homes" for working men and women.
"A most valuable handbook."—*The Builder.*
To be had at the Office of the Society for Improving the Condition of the Labouring Classes, 21, Exeter Hall, Strand. Price 7*s.* Also Designs for Cottages, numbered on sheet, with Specification, &c.

NEW MAGAZINE.
On TUESDAY, FEBRUARY 22, will be published the FIRST NUMBER of
"THE FIELD" QUARTERLY MAGAZINE AND REVIEW, which will contain a vast quantity of original matter, and a collection and epitome of the best articles, and most useful information from "THE FIELD" newspaper, relating to Fishing, Shooting, Hunting, Racing, Coursing, Rowing, Yachting, Gardening, Farming, Natural History, the Kennel, the Stable, and all other subjects of interest to sportsmen and country gentlemen.
Price 2*s.* 6*d.* Annual subscription for one copy, post-free, 11*s.*
Office: 346, Strand, London.

Just Published, price 8s. by post, 8s. 2d.

REPORT on TRAMWAYS in the METROPOLIS.
By WILLIAM BOOTH SCOTT, C.E. Chief Surveyor to the Vestry of St. Pancras, &c.
London: VACHER & SONS, 29, Parliament-street; H. MITCHENER, Eversholt-street, Oakley-square, N.W.

Just published, with fine steel portrait of E. J. Reed, esq. Chief Constructor of Her Majesty's Navy, &c. Price 5s. cloth.

THE YEAR-BOOK of FACTS in SCIENCE and ART. 1870.
By JOHN TIMBS, Author of "Curiosities of Science," &c.
"This excellent little handbook to the chief scientific discoveries of the past year fully maintains its reputation."—*Athenæum*, Feb. 19, 1870.
*** For sets of this valuable series, see advertisement below.
London: LOCKWOOD & CO. 7, Stationers' Hall-court, E.C.

THE YEAR-BOOK of FACTS in SCIENCE and ART.
As an inducement to new subscribers, sets from 1861 to 1840, with an extra vol. 1862 (11 vols. in all), will be supplied, post-free, for 42s. if ordered direct from the publishers. Post-office Orders to be made payable to
LOCKWOOD & CO. 7, Stationers' Hall-court, E.C.

Just published, price 6d. by post 7d.

BUILDING LEASES: Observations on the Judgment Boulton *v.* Commissioners of Inland Revenue. By T. W. WEBB.
London: VACHER & SONS 29, Parliament-street.

PARTNERSHIP. — 500*l.* WANTED, to join the Advertiser in an old-established BUILDING and CONTRACTING BUSINESS, in the south of Wales. A young man with a knowledge of the joinery department preferred.—Address, by letter only, B. C. 15, Lower Ashby-street, Northampton-square, London.

PERSPECTIVES Prepared and Coloured in First Style.
Address, H. STYAN, Albert-street, Manchester.

PERSPECTIVES, COMPETITION, DETAIL, and WORKING DRAWINGS, LAND SURVEYING, and LEVELLING.—Address, C. 47, London Wall, E.C.

BOROUGH of SALFORD.—WANTED, a thoroughly efficient CLERK of WORKS to Superintend Alterations at the Salford Town-hall and other Works. Salary, 2*l.* 10*s.* per week. Applications, stating age and former engagements, accompanied with testimonials, to be sent in not later than the 9th MARCH next, addressed to the Chairman of the Salford District Town-hall, &c. Committee, and endorsed "Application for Clerk of Works." Further information may be obtained by application to Mr. BOWDLER, Surveyor of the Salford district.—By order,
GEORGE BRETT, Town Clerk.
Town-hall, Salford, 16th February, 1870.

ELECTION of DISTRICT SURVEYORS under the Metropolitan Building Act, 1855.—The Metropolitan Board of Works hereby give Notice that they will, on FRIDAY, the 4th day of MARCH next, at TWELVE o'clock at Noon, at their Office, Spring-gardens, Charing-cross, proceed to the ELECTION of SURVEYORS for the following Districts:—
1. The District of Lewisham, containing the Northern portion of the Parish of Lewisham.
2. The District of Sydenham, containing the Southern portion of the Parish of Lewisham, lying South of the Lewisham District.

Applications, in writing, with certificates of competency under the Building Act, addressed to the Clerk of the Board, will be received at the Office of the Board, until FOUR o'clock p.m. on TUESDAY, the 1st MARCH. Each candidate must state the District he applies for, and must be in attendance at the Meeting of the Board on the 4th March. JOHN POLLARD, Clerk of the Board.
Spring-gardens, 19th February, 1870.

TO BUILDERS, DECORATORS, &c.

GILDERS, thoroughly experienced in House Work, Decorative Furniture, and Gilding in all its branches, may be OBTAINED at the House of Call, Marlborough Inn, Blenheim-steps, Oxford-street. Work done by the day, hour, or job. Materials found if required.—Address to the Secretary.

PUPIL.—An ENGINEERING and LAND SURVEYOR, who also has a public appointment at Great Grimsby, has a VACANCY for an ARTICLED PUPIL. Premium required.—Address, X. Y. Z. Mr. Eden's, Bookseller, Great Grimsby.

AGENTS WANTED in various parts of Great Britain, by J. STONE & CO. Deptford, London, to push the sale of their Patent "Universal" Brass Regulators for Water-closets, acknowledged to be the cheapest and best in existence. Liberal terms allowed.

WANTED, Two ASSISTANT SURVEYORS, by the Vestry of St. Pancras. One for the North district, at a salary of 125*l.* per annum, with a conditional annual increase of 5*l.* to a maximum of 150*l.* per annum; and the other for the Central district, at a salary of 100*l.* per annum, with a conditional annual increase of 5*l.* to a maximum of 130*l.* per annum. Candidates must be between 25 and 35 years of age. The persons elected will be required to commence their duties on the 25th March next, and to reside in the parish. The appointment to be determined by one month's notice from any time by either party, or by payment of one month's salary in lieu of notice. Particulars as to duties may be known upon personal inquiry at the Vestry Offices. Applications upon forms provided for that purpose, accompanied by testimonials of recent date, and not exceeding six in number, must be forwarded to me not later than FRIDAY, the 4th MARCH next. Candidates to attend at the Vestry-hall, King's-road, Pancras-road, on WEDNESDAY, the 9th MARCH next, at THREE o'clock in the afternoon. No travelling or other expenses allowed on any occasion of attendance.—By order,
THOMAS ECCLESTON GIBB, Vestry Clerk.
Vestry Offices, 10th February, 1870.

TO SURVEYORS, BUILDERS, AND OTHERS.

WANTED, a FOREMAN'S SITUATION, or Piecework. First-class references can be given from where last employed.—Address, X. Y. 3, Blandford place, Kentish-town-road.

WANTED, in the office of an Architect and Surveyor in the City, a well qualified ASSISTANT.—Address, No. 541, Office of "The Builder."

WANTED, a QUANTITY SURVEYOR'S ASSISTANT, able to abstract and bill dimensions, and to measure works.—Apply, by letter only, stating salary required and references, to Messrs. RICHARDSON & WAGHORN, 35, Craven-street, Strand.

WANTED, a YOUTH, for a short period, competent to Trace and Copy Drawings, neatly and accurately.—Apply, by letter only, stating age, terms, and references, to H. G. B. 10, Old Jewry-chambers, E.C.

TO ARCHITECTS' CLERKS.

WANTED, in the Office of an Architect, a CLERK. He must be a neat, expeditious, and accurate draughtsman. — Apply, with full particulars and terms, to L. J. B. Post-office, Reigate, Surrey.

TO CARPENTERS AND BUILDERS.

WANTED, by a Young Man, aged 21, a SITUATION as IMPROVER.—Address, A. Z. 7, King-street, Portman-square.

TO BUILDERS AND CONTRACTORS.

WANTED, by a thoroughly practical Man, a RE-ENGAGEMENT as GENERAL FOREMAN, or to Take Charge of a Job. Joiner by trade. First-class references from London firms.—Address, T. R. 8, Palace-road, Lambeth.

TO ARCHITECTS AND BUILDERS.

WANTED, a RE-ENGAGEMENT, as CLERK of WORKS, SHOP or GENERAL FOREMAN, or to take Charge of a Job. A joiner by trade. Aged 42. Has a general knowledge of all branches of the building trade. Good reference from former employers. No objection to the country.—Address, J. C. 47, Alexandra-road, Kilburn Park.

TO BRICKMAKERS AND CONTRACTORS.

WANTED, by a respectable Man, a SITUATION as FOREMAN, or by the Thousand, in a Brickfield. First-class references.—Address, S. B. T. 6, Manor-terrace, Chiswick, Middlesex.

WANTED, EMPLOYMENT, by a CAR-PENTER and JOINER. Used to shop and office fittings, all kinds of blinds, and capable of taking charge of plans, specifications, and accounts.—Address, No. 123, at 51, Bedborough-place, Pimlico, S.W.

TO BRICK AND TILE MANUFACTURERS.

WANTED, by a thoroughly experienced Man, a SITUATION as FOREMAN, both in stock work, close or Scotch kilns, pipes, tiles, &c.; or to take at per 1,000. Good reference can be given.—Address, A. B. Post-office, Larkhill-lane, Clapham, Surrey.

TO BUILDERS AND PLUMBERS.

WANTED, a SITUATION, by a first-class PLUMBER, in all its branches. Thoroughly understands all kinds of pump-work, gasfitting, zinc-work, and painting. Has no objection to the country.—Address, C. R. Plumber, 7, Camberwell-road, S.E.

TO BUILDERS, PLUMBERS, &c.

WANTED, by a good PLUMBER, a SITUATION or JOB. Can do gasfitting and plain zinc-work. No objection to painting and glazing. Good references. No objection to the country.—Address, J. V. 33, Harvey-road, Camberwell Park, S.E.

TO BUILDERS AND HOUSE DECORATORS.

WANTED, by a thoroughly practical Man, aged 30, a RE-ENGAGEMENT as FOREMAN. Good experience in writing, graining, and decorating. First-class reference from last situation at the Wood. Specimens of workmanship can be shown.—Address, F. B. No. 20, Caledonian-road, King's-road, Chelsea.

WANTED, by a good DRAUGHTSMAN, an ENGAGEMENT in the office of a Civil Engineer or Land Surveyor. Has had considerable experience. Terms moderate. Good testimonials.—Address, G. W. General Post-office, Hammersmith.

TO PLUMBERS, HOUSE DECORATORS, GASFITTERS, &c.

WANTED, by a respectable energetic Young Man, aged 20, a SITUATION as MANAGER and CLERK, in a good business in the above line. Thoroughly understands estimating and bookkeeping. Three years as manager in present situation. Disengaged on the 1st April next. Good references. Apply, with full particulars, to A. B. Mill-house, St. Mary Cray, Kent.

WANTED, by the Advertiser, a SITUA-TION as WORKING FOREMAN of PAINTERS. Good references.—Address, A. D. 31, Thornhill-street, Caledonian-road, N.

TO ARCHITECTS, &c.

WANTED, by the Advertiser, aged 21, a RE-ENGAGEMENT, as ASSISTANT in an Architect's or Surveyor's Office. Five years' experience.—Address, W. D. No. 103, Manor-street, Chelsea, S.W.

TO ARCHITECTS AND OTHERS.

WANTED, by a thorough practical and efficient CLERK of WORKS, an ENGAGEMENT. Has had great experience in all branches of the building trade. Has good testimonials and references.—Address, X. Y. Post office, Shepherd's Bush.

WANTED, PAVING, Foot or Carriage-way, Kerb Setting, or Granite Dressing, to TAKE by the PIECE, by a first-class practical Man, of twenty-five years' experience under Dock, Railways, Metropolitan Boards, and Government Engineers. One trial. — Address, JAMES CRUTCHLEY, No. 7, James-place, North-street, Poplar.

WANTED, by a thoroughly practical Man, a RE-ENGAGEMENT as CLERK of WORKS, or Managing Foreman. Well acquainted with detail in all branches, setting out, and measuring up work. Over nine years in last engagement on many important works. Good references. Town or country.—Address, T. G. No. 115, Southampton-street, Camberwell, S.E.

TO BUILDERS AND CONTRACTORS.

WANTED, a SITUATION, as CLERK to the above. Thoroughly understands the routine of the Office. Good references. Aged 22.—Address, A. Y. Messrs. Terry, Stoneman, & Co. 6, Hatton-garden, E.C.

TO ARCHITECTS, &c.

WANTED, by the Advertiser, aged 21, an ENGAGEMENT as JUNIOR ASSISTANT. Neat draughtsman. Salary not so much an object as permanent employment and improvement. — Address, L. G. 16, Lyndhurst Grove, Peckham, S.E.

TO BUILDERS AND CONTRACTORS.

WANTED, to place a respectable Youth, now in his sixteenth year, as IN-DOOR APPRENTICE, for four years, with a Builder who will undertake that a good practical knowledge of the trade in all its branches shall be taught. No premium will be paid down, but board wages after the rate of 10*s.* per week will be paid during the first two years. Country not objected to if within a reasonable distance.—Apply to J. D. BLYTH, Lime and Cement Merchant, Leytonstone, Essex, N.E.

TO BUILDERS.

WANTED, a RE-ENGAGEMENT, by a useful BUILDER'S FOREMAN, in or out of the Shop. Is very systematical, and a superior practical Draughtsman.—Address, T. J. S. Post-office, Reigate, Surrey.

WANTED, EMPLOYMENT, by the Advertiser, who understands Levelling, Surveying, Preparing Drawings, Taking Out Quantities, &c. and the Superintendence of Works. Salary moderate.—Address, O. P. Mr. Fortune's, Rainhill, Lancashire.

TO ARCHITECTS.

WANTED, by the Advertiser, who is a first-class GOTHIC DRAUGHTSMAN, TEMPORARY EMPLOYMENT.—Address, 546, Office of "The Builder."

TO ARCHITECTS, &c

WANTED, by a thoroughly practical energetic man, a SITUATION as CLERK of WORKS. Town or country. Excellent testimonials.—Address, 536, Office of "The Builder."

TO BUILDERS AND OTHERS.

WANTED, by the Advertiser, a SITUA-TION or JOB, as PLUMBER and ZINC WORKER. No objection to fill up his time in other branches of the trade. Good references can be had from last place. Town or country.—Address, A. E. 14, Waverley-road, Harrow-road, W.

WANTED, a RE-ENGAGEMENT, as SHOP FOREMAN of JOINERS, GENERAL FOREMAN, for MANAGER, by a thoroughly practical Man. Proficient in all branches. Can design, take out quantities, estimate, &c. References and testimonials, as to character and capabilities.—Address, 525, Office of "The Builder."

WANTED, PLASTERING, by a thoroughly practical PLASTERER (labour only). Town or country. Or as WORKING FOREMAN.—Address, G. A. 3, St. John's road, South Norwood, S.E.

TO BUILDERS.

WANTED, by a thoroughly practical PLASTERER, a SITUATION as FOREMAN, or to take Plastering by the Piece, either in town or country. Is well acquainted with the nature of Portland and other cements. First-class testimonials.—Address, BETA, 30, Raphael-street, Knightsbridge, S.W.

TO ARCHITECTS AND SURVEYORS.

WANTED, a SITUATION, as ASSIS-TANT, by one who has completed his Articles in an Architect and Borough Surveyor's Office. Is a neat draughtsman, can design, and make detail and working drawings. Good references.—Address, G. M. FARMER, Rachymbyd, Ruthin.

TO NOBLEMEN, ESTATE AGENTS, AND OTHERS.

WANTED, by the Advertiser, a SITUA-TION as CARPENTER upon an Estate. A thoroughly practical man, used to jobbing, and understands the building trade generally. Aged 36. Married. Five years' reference from last employer.—Address, A. B. 13, York-terrace, Maxwell-road, Fulham.

TO HOUSE DECORATORS.

WANTED, by a respectable Young Man, IMPROVEMENT in GRAINING and MARBLING, in a good firm. Has been six years in the trade.—Address, by letter, stating terms, F. D. care of G. Stevens, 29, Liquorpond-street, Gray's-inn-road, London.

TO BUILDERS.

WANTED, by a thoroughly practical Man, Joiner by trade, a RE-ENGAGEMENT as GENERAL OUTDOOR FOREMAN, or to Take Charge of a Job. Has just finished a job in London. First-class references as to character and ability. Aged 35.—Address, J. N. 62, Davies-street, Berkeley-square, W.

WANTED, by a thoroughly practical and energetic Man, a Joiner by trade, a JOB to work a GENERAL JOINER. No objection to go abroad.—Address, D. F. 10, Walgrave-road, Earl's-court, Kensington, W.

TO ARCHITECTS, &c.

WANTED, a RE-ENGAGEMENT, temporary or otherwise. Is a really good Draughtsman and Colourist, and can, from rough sketches, prepare finished drawings for competition, &c. Good references. Salary moderate.—Address, G. D. 38, Museum-street, W.C.

TO ARCHITECTS AND BUILDERS.

WANTED, by a practical CLERK of WORKS, a RE-ENGAGEMENT, or a Situation as Managing FOREMAN. Competent to prepare plans, working and detail drawings, measure up work, take out quantities, and estimate.—Address, M. N. 3, Cumberland-place, North-end, Hammersmith, W.

WANTED, a RE-ENGAGEMENT, as WORKING SHOP FOREMAN of JOINERS, or as General Out-door Foreman, by a thoroughly practical Joiner and Staircase Hand. Aged 31. Well up in setting out all kinds of work. Would have no objection to take piece-work. First-class testimonials from London firms. Country not objected to.—Address, H. K. 8, Rodney-street North, Barnsbury.

TO ARCHITECTS, SURVEYORS, CIVIL ENGINEERS, &c.

WANTED, by a Youth, aged 19, a SITUA-TION as IMPROVER. Can trace and copy drawings well, and is also a tolerable colourist. Salary moderate.—Address, B. Z. 51, Willes-road, Kentish Town.

WANTED, by the Advertiser, aged 26, a permanent SITUATION as thorough HOUSE PAINTER, Glazier, and Paperhanger. Country preferred.—Address, T. A. 3, Salisbury-terrace, White Post-lane, Little Ilford, Essex.

TO MASONS AND BUILDERS.

WANTED, by a thoroughly competent Man, Mason by trade, a RE-ENGAGEMENT as FOREMAN of MASONS, or to take entire Charge of a Job. First-class references. Address, W. R. 9, Paris-street, Lambeth, S.W.

TO ARCHITECTS AND BUILDERS.

WANTED, by a thoroughly practical Man, who has a Workshop, STAIRS and JOINERS' WORK, by the Piece. Terms moderate.—Address, W. P 17, Doune-cottages, Regent's Park.

TO GASFITTERS, PLUMBERS, &c.

WANTED to APPRENTICE, a well-educated Youth (indoor). Small premium given.—Address, E. C. 12, Allcroft-road, Lismore-circus, Kentish-town, N.W.

TO BUILDERS, PLUMBERS, AND OTHERS.

WANTED, by a respectable Young Man, a SITUATION as PLUMBER. Good reference.—Address, J. F. S. 9, Cumming-street, Pentonville-hill.

TO BUILDERS AND PLUMBERS.

WANTED, a JOB, by a good PLUMBER and GASFITTER. Thoroughly understands bath and zinc work.—Address, T. B 12, St. John-street, Peter-street, Islington, N.

TO CABINET FIRMS.

THE Advertiser, who has had several years' practical experience in the most eminent London firms, desires a SITUATION as SALESMAN, or to Keep the Books in a Factory, where he would have no objection to filling up his time at the bench if required. References to last employer.—Address, 565, Office of "The Builder."

THE Advertiser, for some years Assistant to the late Mr. James Wyllson, requires an ENGAGEMENT with an Architect and Surveyor. Has been accustomed to quantities and measurements.—Address, H. G. Mrs. Wyllson, 10, Florence-street, Islington, N.

TO TOWN TRAVELLERS.—A Gentle-man, having a connexion amongst first-class Builders, Decorators, and General Painters, will find this an opening to represent an old-established London House.—Apply, by letter to Y. Z. Messrs. Tippetts & Son, 5, Great St. Thomas Apostle, Queen-s road, E.C.

TO ARCHITECTS, SURVEYORS, BUILDERS, &c.

THE Advertiser (shortly disengaged), well up in Design and Practical Details, Surveying, Quantities, Perspective, &c. Aged 27. Ten years' experience; the last four years and a half with a first-class West-end builder.—Address, A. T. B. 34, Wellington-square, Chelsea, S.W.

THE Advertiser, aged 32, a good Draughtsman, competent to superintend any kind of building work, and experienced in railway and drainage works, seeks an ENGAGEMANT.—Address, A. A. Post-office, 59, Southgate-road, N.

TIMBER TRADE.—WANTED, a RE-ENGAGEMENT as SALESMAN, YARD FOREMAN, &c. by a Young Man, aged 28. Quick, active, and industrious. Three years in a London yard. Salary no object.—Address, WILLIAM, No. 9, William-street, Kennington Park-road, S.E.

TO ARCHITECTS, &c.

THE Advertiser, who is a very quick first-class general DRAUGHTSMAN and DESIGNER, desires EMPLOYMENT. Permanent preferred.—Address, A. F. B. 70, Offord-road, Barnesbury, N.

NOTICE.—BUILDERS WANTING STONEWORK DONE, of any kind (labour only), will be attended to, by addressing to R. S. 44, Great Guildford-street, Southwark.

GRAINER and WRITER.—WANTED, by a first-class Workman, a SITUATION for a permanency.—Address, JONES, Grainer, &c. Hodnet-bower, Ironbridge, Salop.

EMPLOYMENT WANTED, by a Joiner's Machine Hand, to WORK GENERAL JOINER, Trying-up, Moulding Machines, or Saw Bench.—Address, W. P. 21, Allen-street Westminster-road, S.W.

A BUILDER'S CLERK requires a RE-ENGAGEMENT. He is well up in prime cost accounts paying large bodies of men, and office work generally. Five years, reference.—Address, J. H. 80, St. John-street, Smithfield.

A FOREMAN ENGINEER is desirous of a RE-ENGAGEMENT. Experienced in engine, mill, and smiths' work, and management of men. Good reference.—Address, ALPHA, 96, Caledonian-road, N.

TO BUILDERS, CONTRACTORS, &c.

A THOROUGHLY Practical GENERAL FOREMAN requires a RE-ENGAGEMENT, in Town or country. Thoroughly experienced in all branches of the building trade, measuring up works, the management of men, &c.—Address, No. 2519, Office of "The Builder."

TO ARCHITECTS.

AN ASSISTANT, well versed in Construction and Detail, requires an ENGAGEMENT. Has also a fair knowledge of Perspective.—Address, 508, Office of "The Builder."

TO BUILDERS.

A BUILDER'S CLERK, who has just left a firm of contractors, where he was estimator, measurer, &c is desirous of meeting with another ENGAGEMENT. He is also an experienced accountant and good draughtsman.—Address, C. R. B. 28, Lilian-road, Castelnau, Barnes.

A CARPENTER and JOINER, aged 26, is in WANT of a JOB, to take piecework of any description or quantity. Town or country.—Address, A. S. 2, Park-place, Church-street, Stoke Newington.

TO BUILDERS AND OTHERS.

A THOROUGHLY good PLUMBER, GASFITTER, PAPERHANGER, and PAINTER, wishes for a SITUATION. Thoroughly understands all branches, and used to management. Wages not so much the object as regular work. Good reference. Country preferred.—Address, PLUMBER, Post-office, Tring, Herts.

TO BUILDERS AND OTHERS.

AS WORKNG FOREMAN of CARPENTERS. Thirty years' experience. No objection to country job.—Address, T. F. No. 4, Cambridge-terrace, Bridge-road, Battersea.

A FIRST-CLASS LAND SURVEYOR, ENGINEER, and DRAUGHTSMAN, who has had many years' practical experience in Estate, Town and Railway Surveys, and Works, desires EMPLOYMENT, either temporary or permanent in England or abroad. Would undertake any work by contract or otherwise.—Address, SURVEYOR, 17, Regent-square, London, W.C.

TO ARCHITECTS AND SURVEYORS.

A WELL-QUALIFIED GENERAL ASSISTANT, who is at present engaged in the country, is anxious to meet with a permanent POST, London preferred. Is a first-class draughtsman. Well up in preparing sketch, detail, and finished drawings. Is accustomed to the careful superintendence of works. Has had considerable practical experience with a first-rate London firm. Good references. Salary moderate.—Address, in the first instance, A. E. T. 215, Pentonville-road, N.

A LONDON ARCHITECT, of twenty years' practice, will shortly have a VACANCY for an ARTICLED PUPIL.—For terms, apply to HENRY DAWSON, Esq. 16, Finsbury-place South, E.C.

TO ARCHITECTS.

A GOOD GOTHIC DRAUGHTSMAN, well up in perspective and detail, requires an ENGAGEMENT as ASSISTANT. Age 27. Good references.—Address, A. B. 22, Penton-street, Pentonville, N.

TO ARCHITECTS.

AN ARCHITECT, of experience, Prepares Working, Detail, and Competition DRAWINGS, Perspectives, Specifications, Estimates, &c. at his own Office.—Address, THETA, at King's Stationer, 13, Duke-street, Portland-place.

TO BUILDERS AND CONTRACTORS.

A BUILDER about to retire is anxious to procure a SITUATION for one of his FOREMEN, who is a thorough, practical, industrious, conscientious, and sober MASON. Five years' character will be given. Also, a first-class JOINERS' FOREMAN.—Address, A 50, Office of "The Builder."

A FIRST-CLASS WORKMAN, who thoroughly understands the work of a Bricklayer and Plasterer in all its branches, and has had considerable experience in drawing plans, and in stone-work, wishes to obtain a SITUATION as FOREMAN to a Builder or Bricklayer. He has had many years' experience, and can be highly recommended.—Address, H. S. Office of "The Builder."

TO DECORATORS, BUILDERS, PLUMBERS, &c.—TO BE DISPOSED OF, at a great sacrifice, a BUSINESS, established nine years, with the lease, of excellent premises, in one of the best situations in the West of London. The proprietor going into the country on account of the health of his wife. Particulars to be obtained of Messrs. GWILLIAM & THORN, Glass Merchants, 77, High-street, Marylebone.

TO BE SOLD, by PRIVATE CONTRACT, the BUSINESS of PAINTER, PAPERHANGER, and HOUSE DECORATOR, carried on for many years most successfully by Mr. James Matthew Marshall, deceased, at Toll-street, in the town of Nottingham. The Premises on which it is carried on are roomy, eligible, and in an excellent situation, with a good and convenient dwelling-house. There is also a large and lucrative trade in Wall Papers. The Business is one of the best in the Midland Counties, and offers an excellent opportunity to those who wish to purchase a standing and going business.—For further particulars, apply to Mr. J. A. LAKE, Hosier, Hounds-gate, Nottingham.

TO BUILDERS and OTHERS.—Established 20 years.—TO BE DISPOSED OF, an old-established BUSINESS, principally jobbing, in a first-class neighbourhood, three miles west of the Marble Arch, capital 12-roomed house, workshops, and large garden. Held on lease. Rent can be let off if required.—For further particulars, apply, personally, to Mr. J. S. GOMME, Auctioneer and Valuer, 23, Old Jewry, and Feltham.

PLUMBER'S BUSINESS.—WANTED, by a good Plumber, a small BUSINESS or a PARTNERSHIP. Would invest from 100l. to 200l. In or near Town preferred.—Address, E. H. 11, Lambeth-road, S.

TO TIMBER MERCHANTS and OTHERS.—An old-established and profitable BUSINESS in the TIMBER TRADE TO BE DISPOSED OF, in consequence of the owner having acquired another property. The Premises comprise a large yard, wharf, with good water frontage, counting-house, &c.: they are easy of access, and in the centre of an important and populous neighbourhood. The profits are good, and the connexion is secure.—For particulars, apply to Messrs. HARDS, VAUGHAN, & LEIFCHILD, 62, Moorgate-street, E.C.

ATTRACTIVE NOVELTIES.—Professor Pepper, "On the last New and Wonderful Ghost Effects, and other Optical resources of the Polytechnic."—The Romantic Tale of Rip Van Winkle, with extraordinary Dioramic and Spectral Scenes, is narrated by Mr. Artis.—Professor Pepper's Annual Course "On Astronomy and Spectrum Analysis," Wednesdays at 2·30 and Saturdays at 3, during Lent, at the ROYAL POLYTECHNIC.

BRICKS.—WANTED, 250,000 Hard STOCKS, delivered alongside in the Thames. No matter about the colour. Lowest price.—Apply, by letter, to A. B. Mr. Kings, Furrier, 49, Gibson-street, Westminster-road, S.E. Terms cash.

SUFFOLK FACING BRICKS.—WHITE and RED SUFFOLK BRICKS, Red Rubbers, Fancy Moulding Bricks to any design, Splays, Plinths, Hard Paviors, Paving Tiles, Copings, and every description of Suffolk goods. Also Grey Stocks, Seconds, Pickings, &c.—THOMAS PLOWMAN, Brick Merchant, Woodpit Kilns, Suffolk; and at Tottenham and Edmonton Brickfields, Middlesex

HOFFMANN'S PATENT KILN, for burning Bricks, Tiles, Pottery, Lime, Cement, and Roasting Ores at a saving of TWO-THIRDS of the FUEL.—For particulars and to see it at work, apply to Mr. H. CHAMBERLAIN, 3, St. John's, Wakefield; or to Mr. HERMANN WEDEKIND, 2, Great Tower-street, E.C. RIDGWAY & CARTER, Exmouth. Agents for Devon.

BRICKS.—To CONTRACTORS, BUILDERS, and OTHERS.—LADENT CORBIERE & SON, ORLEANS BRICK WORKS, Sittingbourne, are prepared to take ORDERS to SUPPLY an unlimited quantity of BEST STOCK BRICKS.—For price, &c. address to their London Office, 20, Cannon-street, E.C.

VICTORIA BRICK and LIME WHARF and DRAW-DOCK, NINE ELMS, S.

BRICKS, TILES, SLATES,
LIME, CEMENT,
HAIR, LATHS, PLASTER,
SAND, BALLAST,
GLAZED DRAIN PIPES AND RED GOODS
TERRA COTTA;
SPLAY, JAMB, AND COPING BRICKS;
SUFFOLK AND OTHER PAVIORS,
RED AND WHITE FACINGS,
STAFFORDSHIRE AND FIRE GOODS,
MALM CUTTERS, PICKINGS,
AND BUILDING GOODS GENERALLY.

A good Stock on the Wharf. Bricks, Sand, Ballast, &c. by barge, alongside, where required.

JOHN DOWNEY, Victoria Wharf, Nine Elms, S.
Also Licensed Lighterman, of 11, Millbank-row, S.W.; and Licensed Lighterman & Wharfinger, of Hermitage Steam Wharf, Wapping, E

BRICKS
Of Every Kind and Quality,
IN ANY QUANTITY, BY BARGE ALONGSIDE.

STAFFORDSHIRE RIDGING and ROOFING TILES, Plain and Ornamental, in Blue or Broseley colour, PAVING TILES in various colours and designs.
Blue Vitrified Grooved and Chequered Pavings for stables pathways, warehouses, &c.
Dressed Blue Facing, BUILDING and SEWER BRICKS.
Illustrated Catalogues on application.

J. & W. EASTWOOD,
Belvedere-road, Lambeth, and Kent-road Bridge,
The usual Commission allowed to Merchants of the Trade.
N.B. Every Description of the Building Goods of the Trade always in Stock.

BRICKS.—IMPORTANT to BUILDERS and OTHERS.—For the year 1870, STOCK BRICKS 21s. 6d per 1,000; grizzels and roughs, 20s. 6d.; place, 17s. 6d.; best Suffolk white bricks, 35s.; seconds, 43s.; best red kilns, 35s.; bats, 15s. per 10,000. Quality to pass any Surveyor. Delivered free alongside at any part of the Thames, below Battersea Bridge, or up Canals, purchasers paying dues. Terms, CASH on DELIVERY.—Address, GEORGE SMEED, Sittingbourne, Kent.

GAULT BRICKS.
OTFORD WORKS, SEVENOAKS, KENT.
White Facings, Sewer Bricks, also Sharp Sand.
LONDON OFFICE, 12, ST. GEORGE STREET, WESTMINSTER.

2,000,000 BRIGHT STOCKS, FULL, SQUARE, AND GOOD.
By Barge or Rail.
DOULTON & CO.
GROVE ROAD, MILE-END, E.

BATCHELAR'S PATENT KILNS for BURNING BRICKS, TILES, POTTERY, LIME, &c.—The attention of Brickmakers, Contractors, and Others, is called to these KILNS. They are the cheapest, most efficient, and economical ever introduced. Bricks made of highly refractory clays may be thoroughly burnt with from three to four cwt. of coals per 1,000, and the goods are sounder and cleaner than can be produced by any other method of burning yet tried.—For full particulars and terms, apply to Messrs. BATCHELAR & PENTON, Brockham, Surrey; or to Messrs. ROTHERGILL, BECK, & CO. Engineers 130, Cannon-street, London.

TO ARCHITECTS.—BURNEY & CO. near the New Docks, Millwall, London, E. only holders of Prize Medals for Galvanized and Plain Iron Cisterns, &c. beg to apprise gentlemen who would on that ground wish to insert their names in specifications, to insure first-class work, that full particulars will be forwarded on application. B. & Co. have recently completed the galvanized iron cisterns for the New Poor-law Asylum and Schools.

SAVING IN GAS.
D. BULSTT, INVENTOR and PATENTEE. The Mercurial Gas Regulator is the only efficient instrument for insuring wholesome and uniform lighting, equalizing the pressure and preventing any irregularity in the height of the flame.
D. BULSTT & CO. 65 and 86, High Holborn.
Manufacturers of Gas Chandeliers, Glass Lustres, &c.

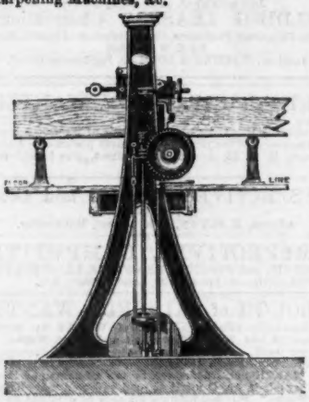
PRIZE MEDAL, LONDON, 1862.

SILVER MEDAL, PARIS, 1867.

GOLD MEDAL, AKOLA, 1868.

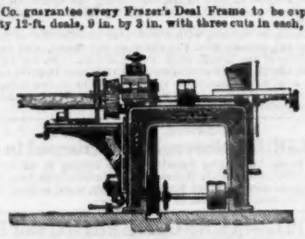
ALLEN RANSOME & CO.

Beg to announce that they have recently brought out an entirely new set of IMPROVED LABOUR-SAVING MACHINES for Builders' and Contractors' purposes, comprising new Patent "General Joiners," Patent Self-acting Saw Benches, Patent Double Deal Frames, Portable Combined Timber and Deal Frames, Patent Planing Machines, Patent Combined Planing and Moulding Machines, Patent Band Saw Machines, Improved Saw-sharpening Machines, &c.



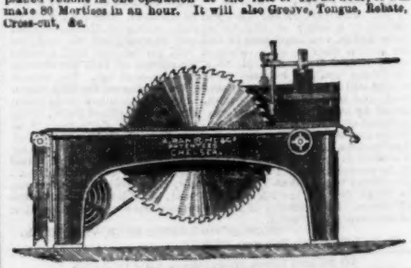
FRAZERS' PATENT
EQUILIBRIUM DEAL FRAME.
Sole Makers: A. RANSOME & CO.

This Frame possesses the following striking advantages above all others, viz.:—
1st. It will do double the work of any other Deal Frame.
2nd. The work it turns out is of the best possible quality.
3rd. It requires less power than any other Frames of an equal capacity.
A. R. & Co. guarantee every Frazer's Deal Frame to be capable of sawing fifty 12-ft. deals, 9 in. by 3 in. with three cuts in each, in one hour.



A. RANSOME & CO.'S
NEW PATENT
GENERAL JOINER.

This machine works Saws up to 20 in. diameter, will plane both sides of a board up to 7 in. wide, or cut single or double mouldings up to 5 in. wide, at the rate of 12 ft. a minute. It will make perfect-planed Tenons in one operation at the rate of 120 an hour, or will make 80 Mortises in an hour. It will also Groove, Tongue, Rebate, Cross-cut, &c.



A. RANSOME & CO.'S
NEW PATENT
SELF-ACTING SAW BENCH.

These are at once the cheapest, most simple, and efficient self acting Saw Benches yet produced. From the arrangement of the feed motion the wear upon the rope is greatly reduced, and the feed being worked direct from the saw-spindle, the amount cut at each revolution of the saw is always the same. They are adapted either for Timber, Deals, or Boarding.

ALLEN RANSOME & CO. furnish plans and estimates of complete sets of Wood-working Machines for Saw-mills, or for Builders, Contractors, or Railway Carriage Builders' Works, Arsenals, Dockyards, &c. and contract to supply, fit up, and start the whole, including Machines, Engines, Boilers, Shafting Bands, Saws, Cutters, &c. for a certain fixed sum, including all items usually charged as extras.

SOLE AGENTS IN THE UNITED KINGDOM FOR
PERIN'S PATENT FRENCH BAND SAWS.

For Illustrated Priced Catalogues, apply to
A. RANSOME & CO.
SAW-MILL ENGINEERS,
304, KING'S ROAD, CHELSEA, S.W.